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SIMPLICITY, TOLERANCE FOR PACIFIC ERA
By ROY W. HOWARD

THE NEW CHINA
THE JAPANESE VIEWPOINT

Vol. XXXIII

JANUARY, 1937

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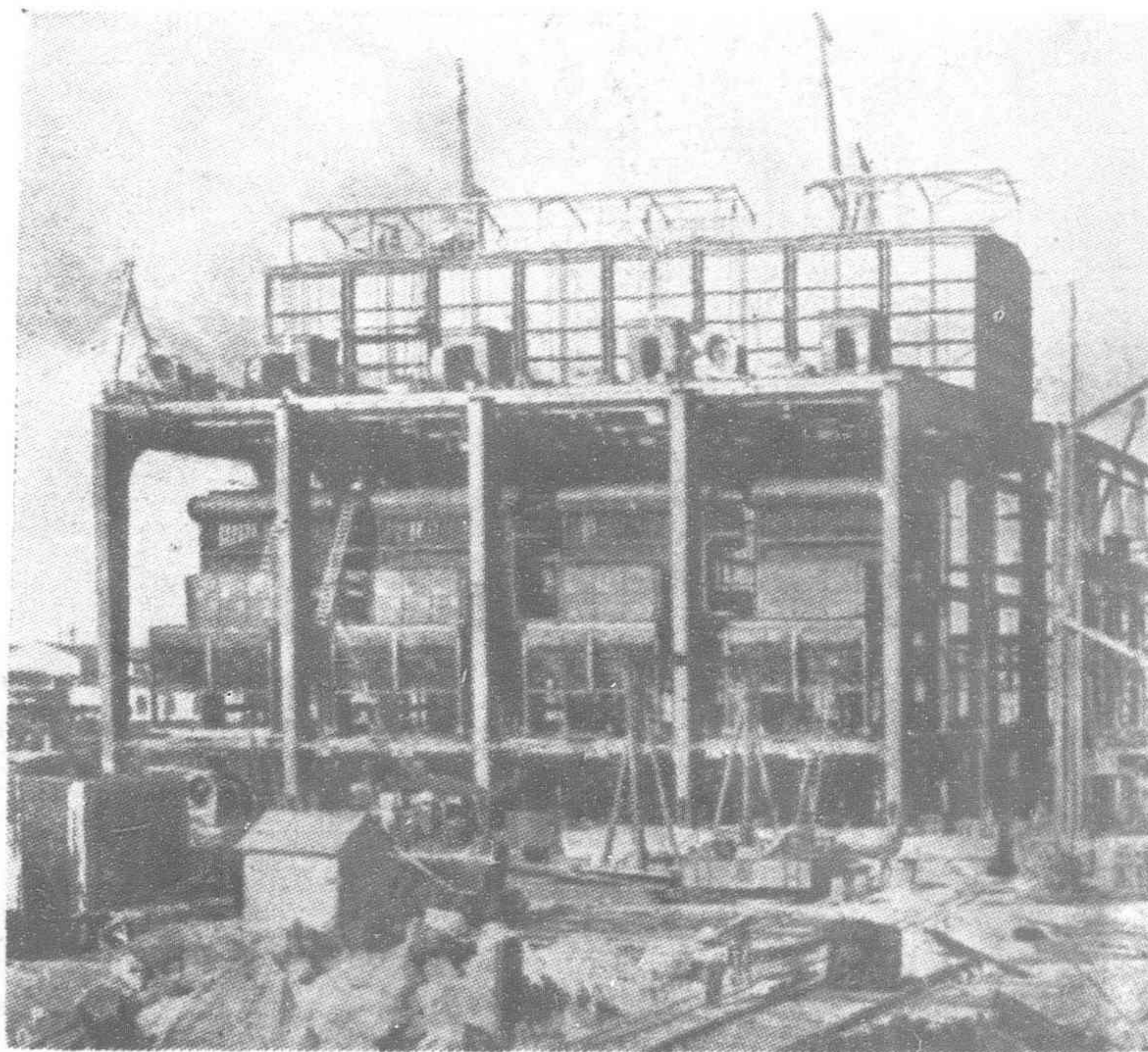
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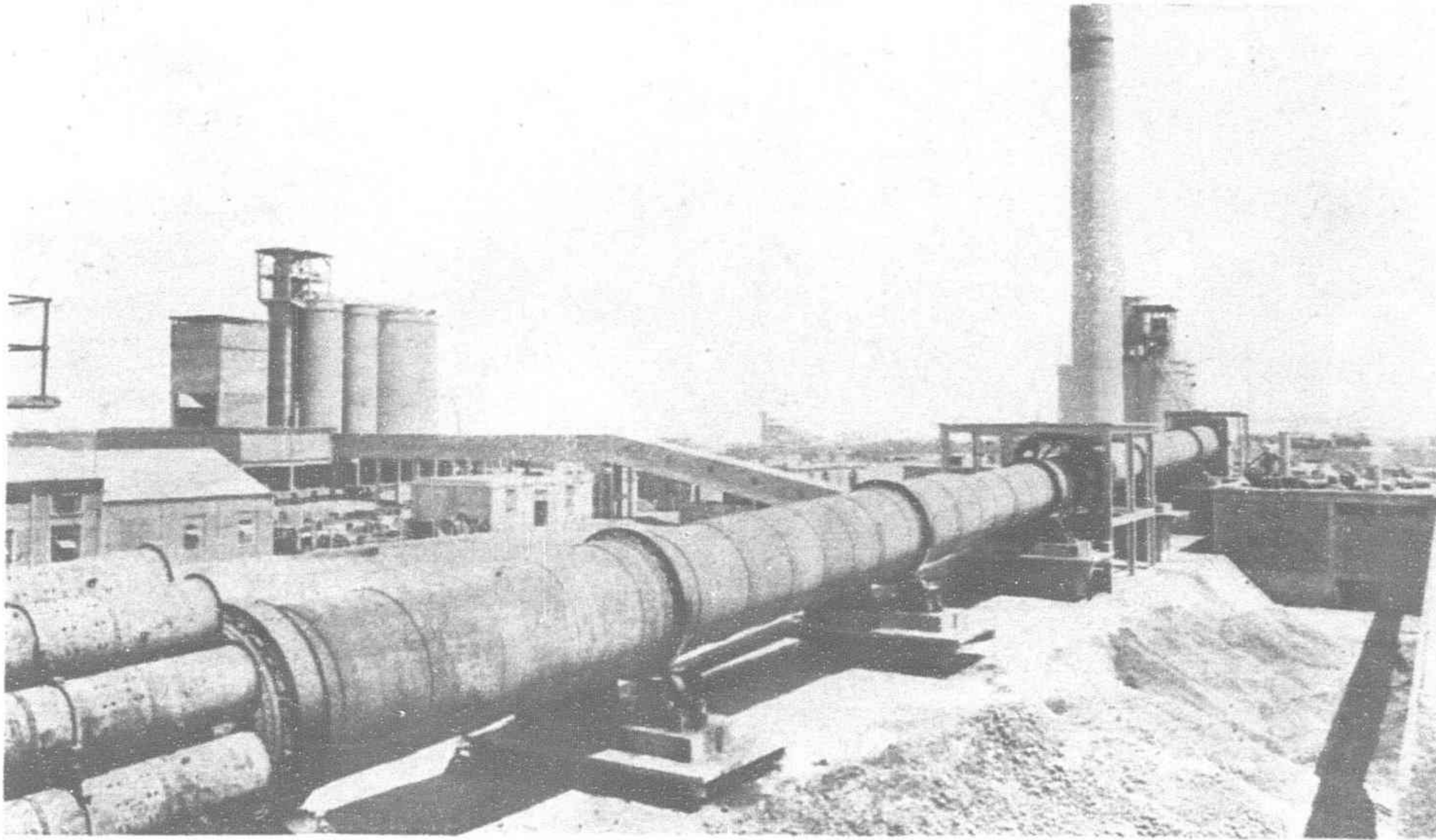
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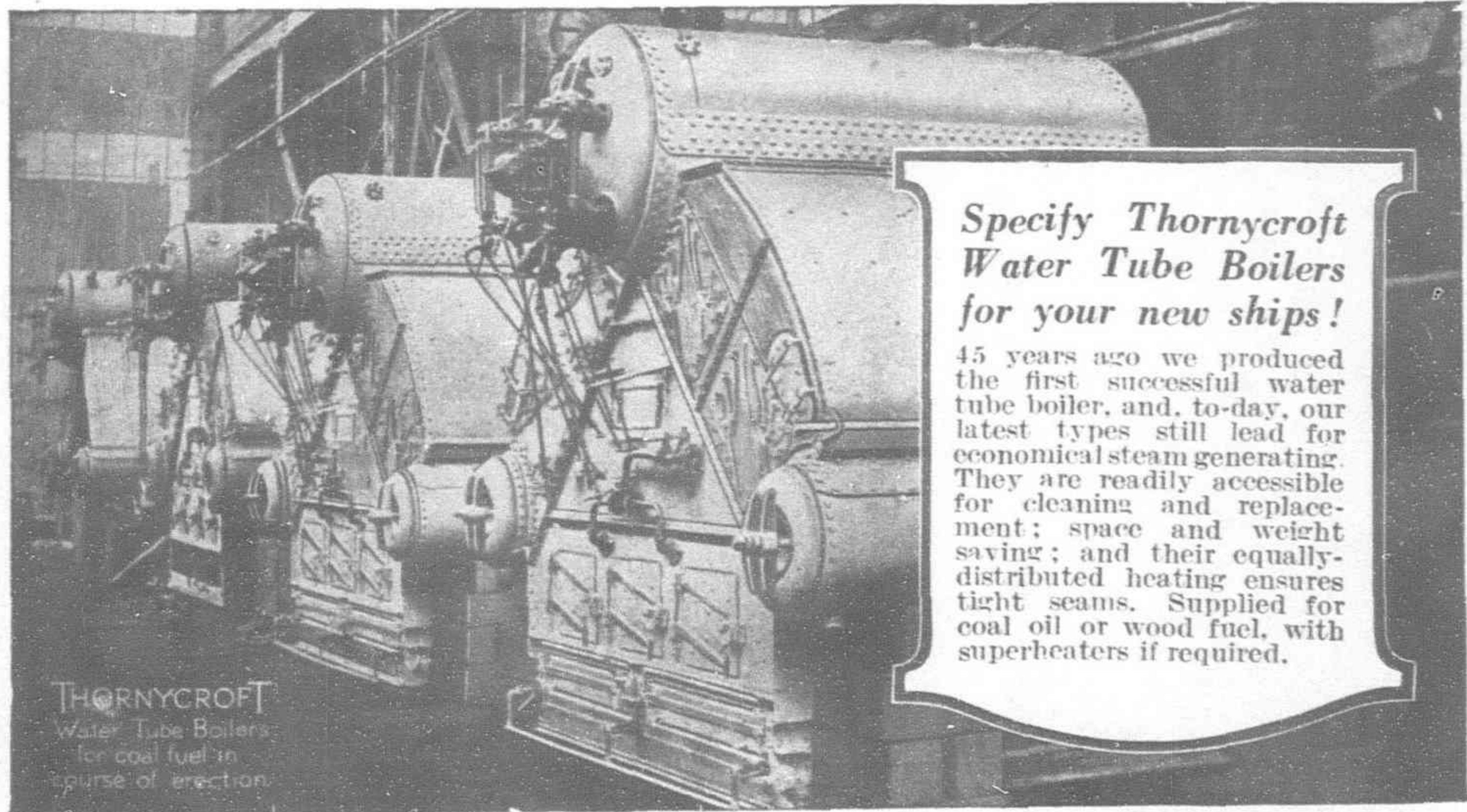
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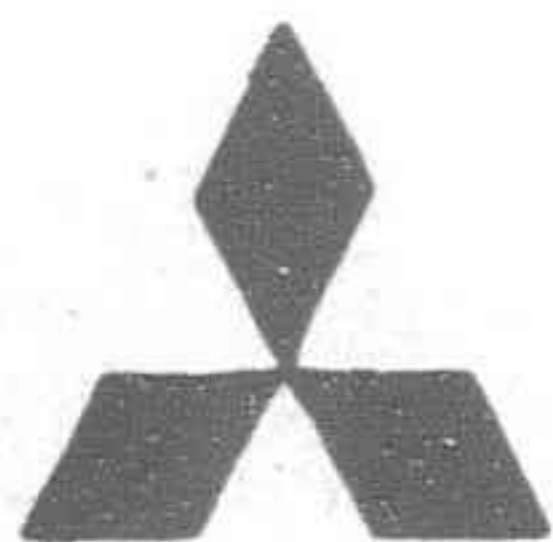
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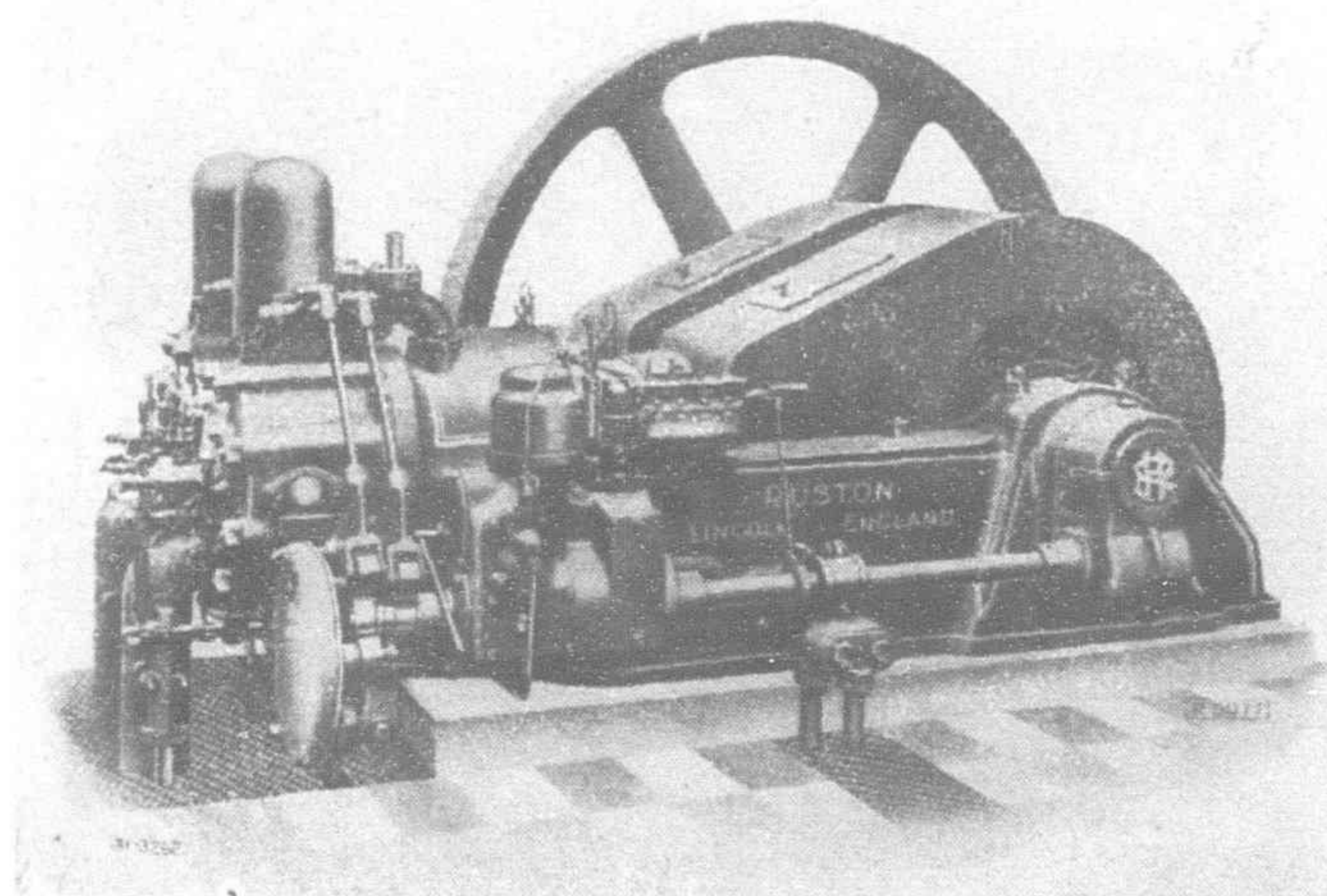
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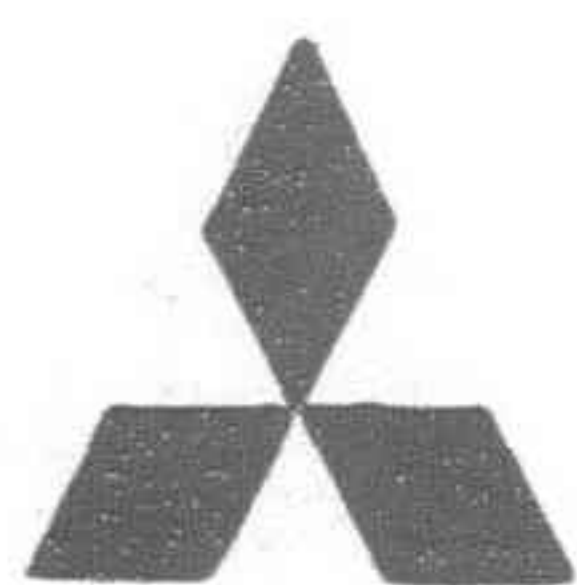
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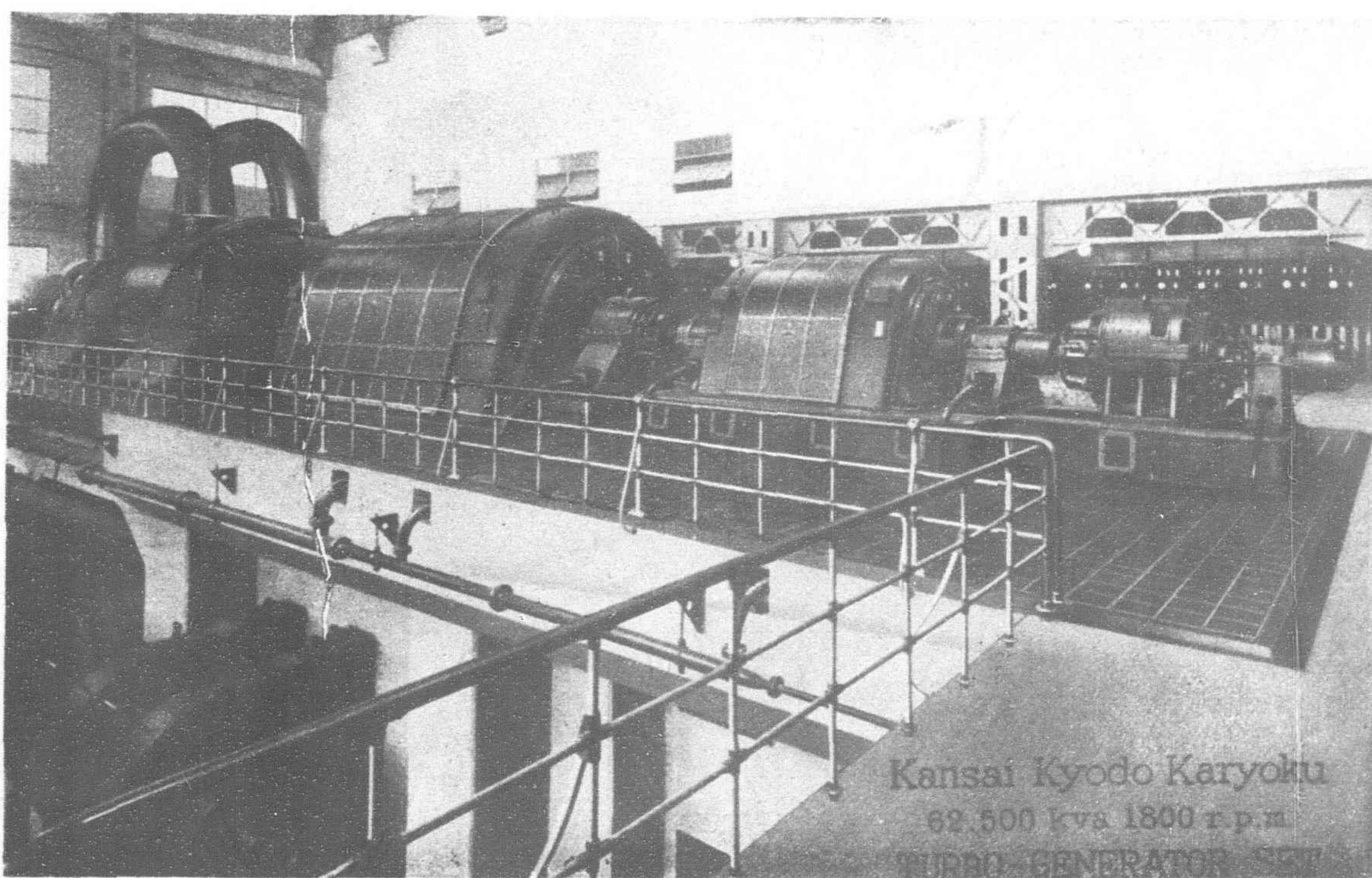
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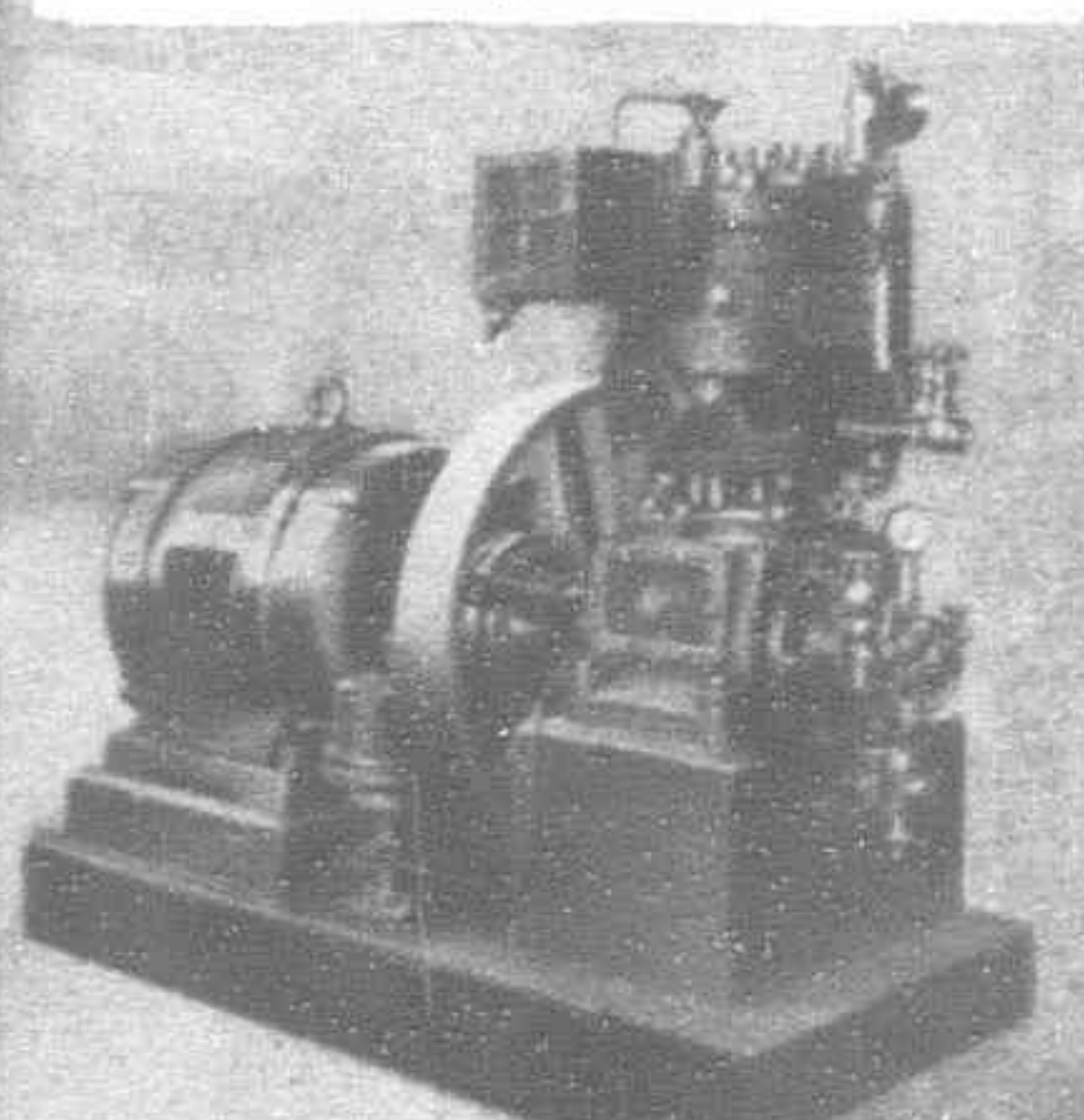
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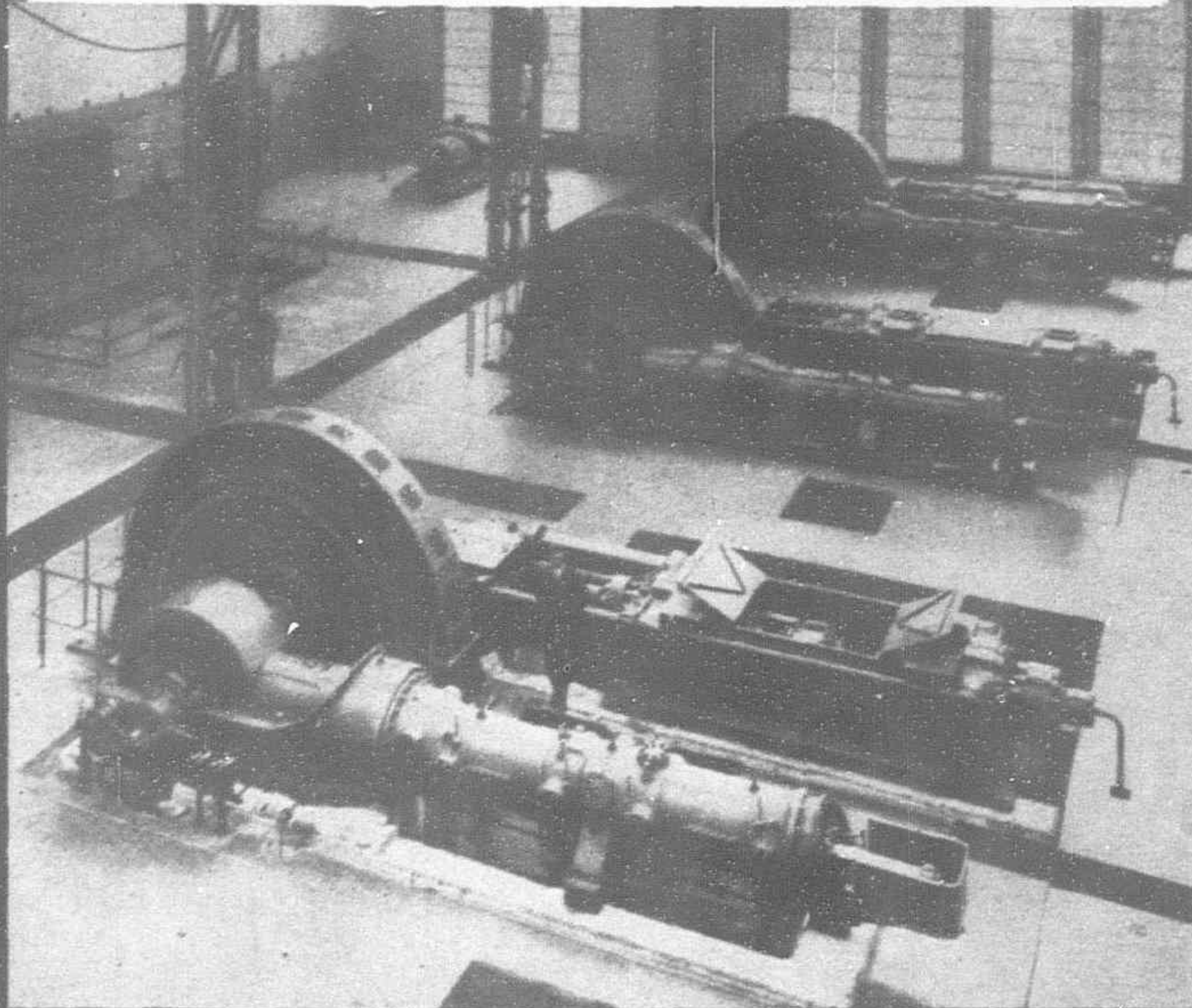
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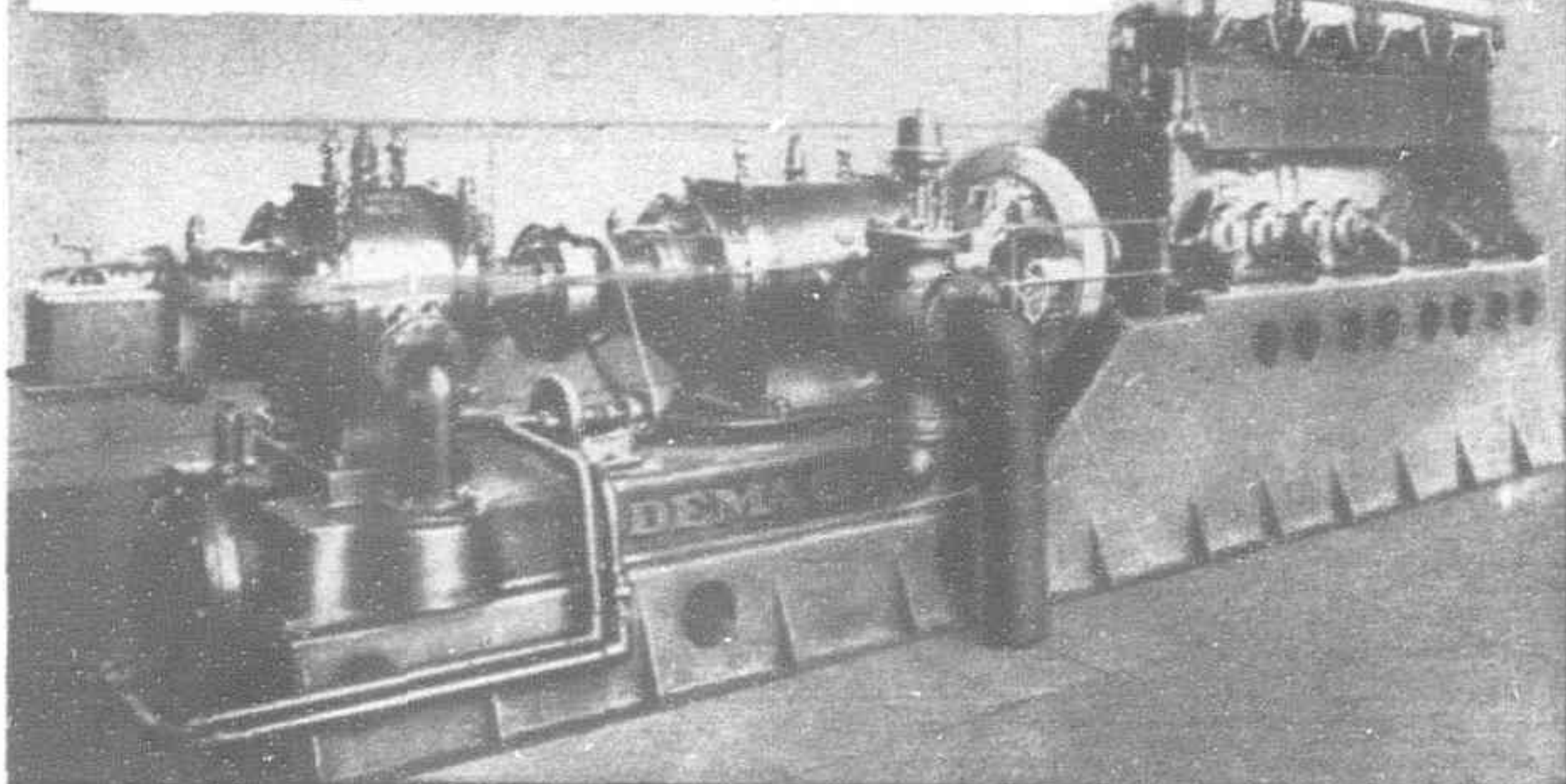
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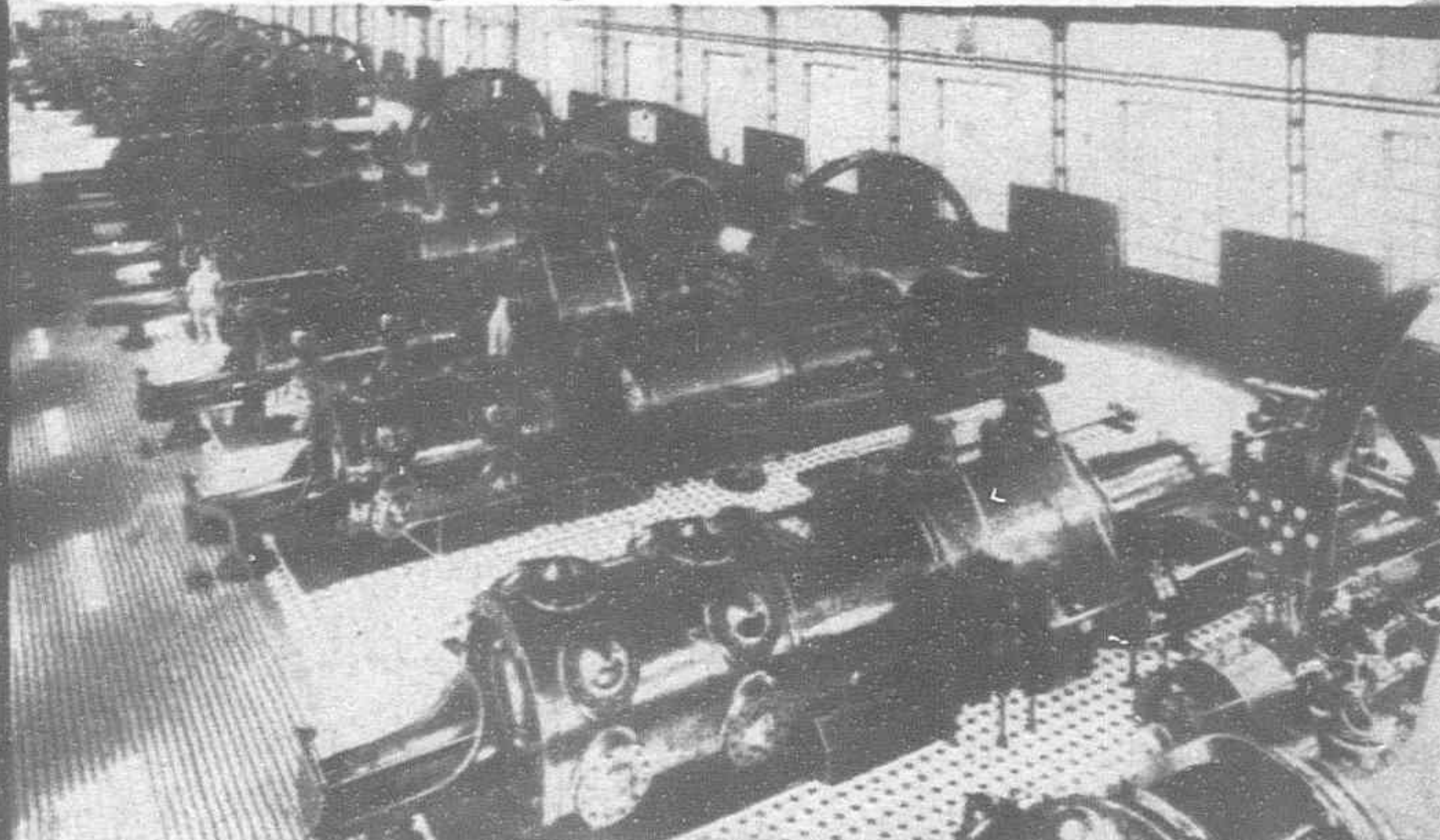
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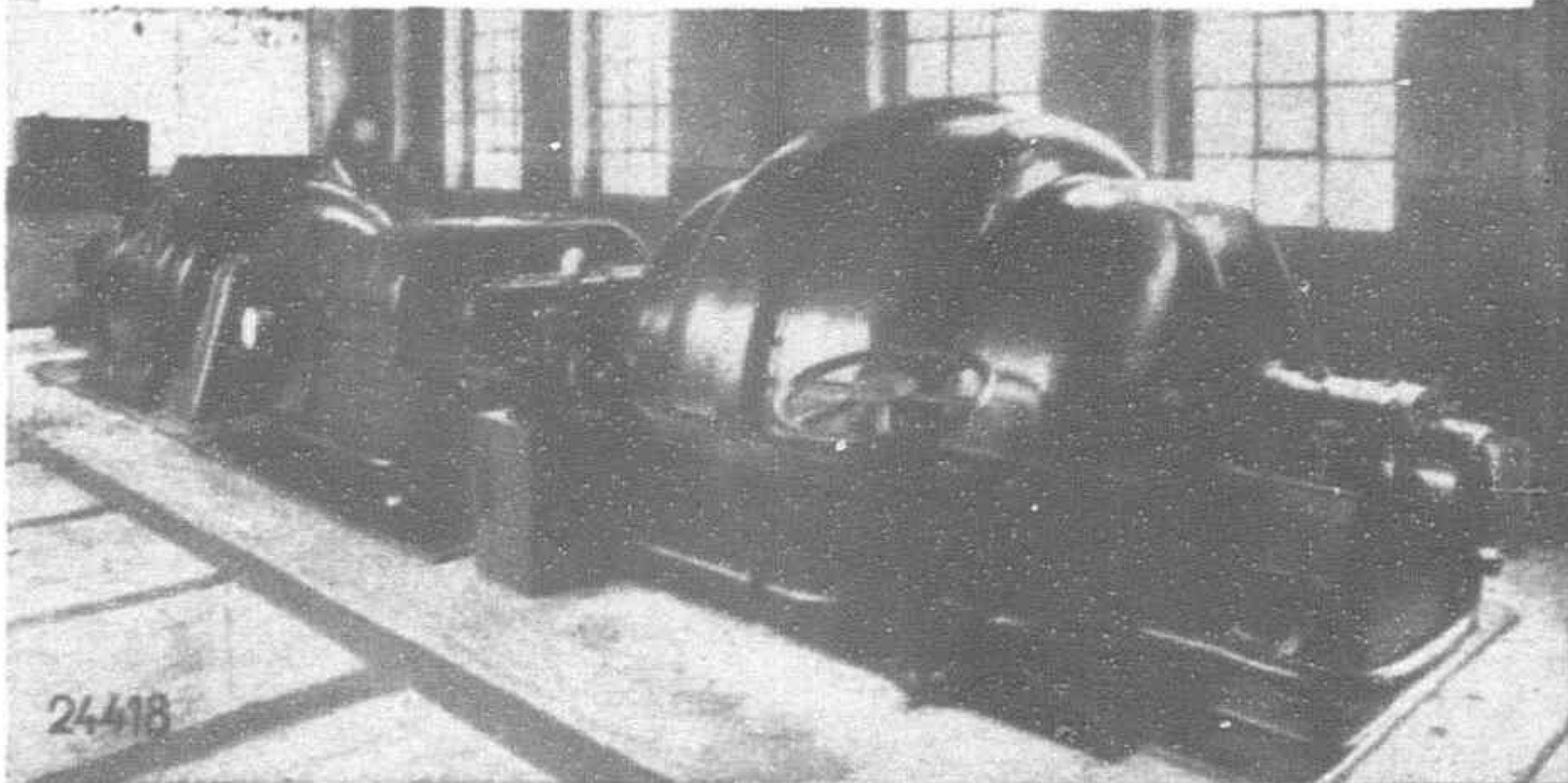
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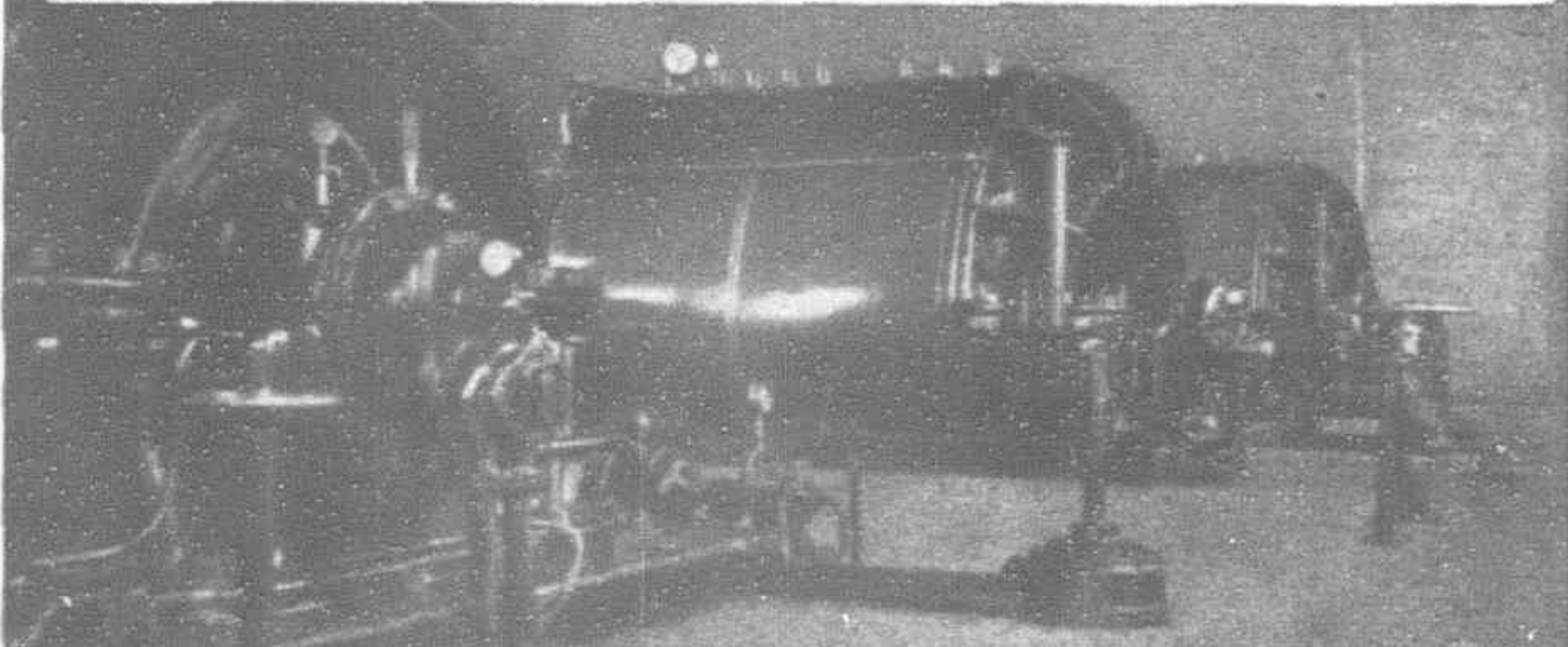


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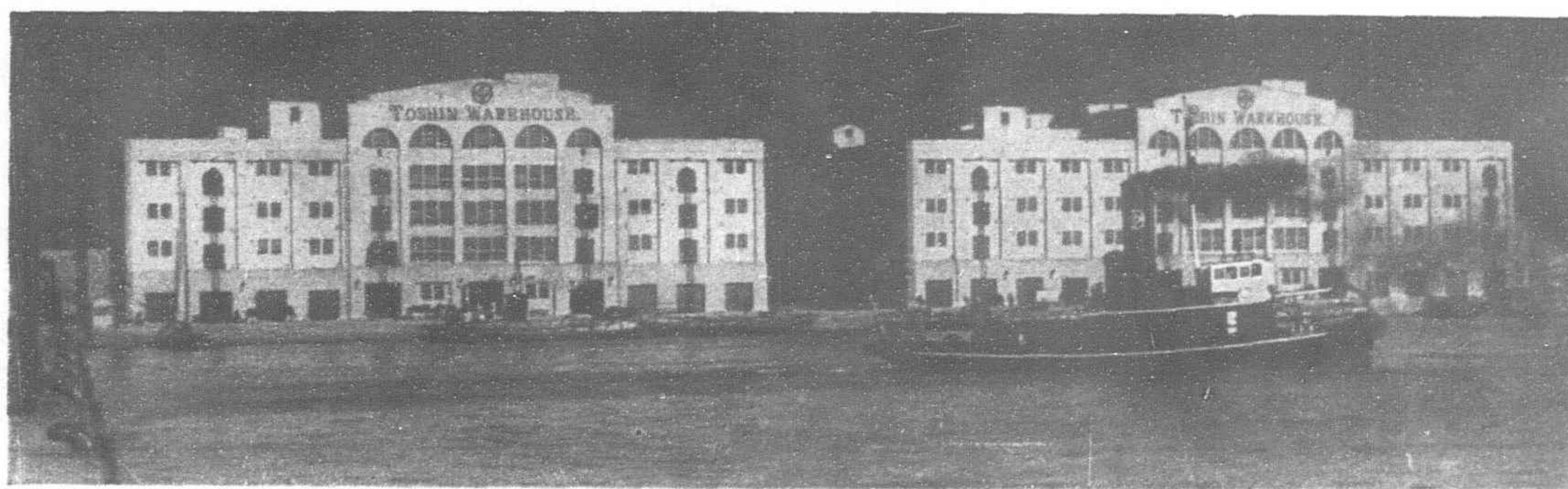
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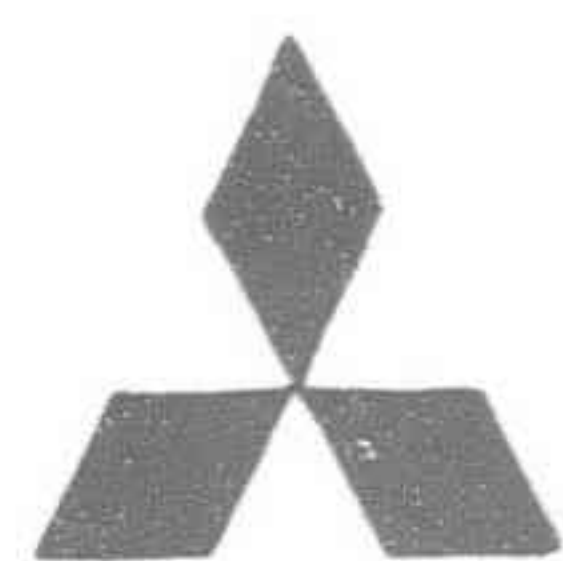
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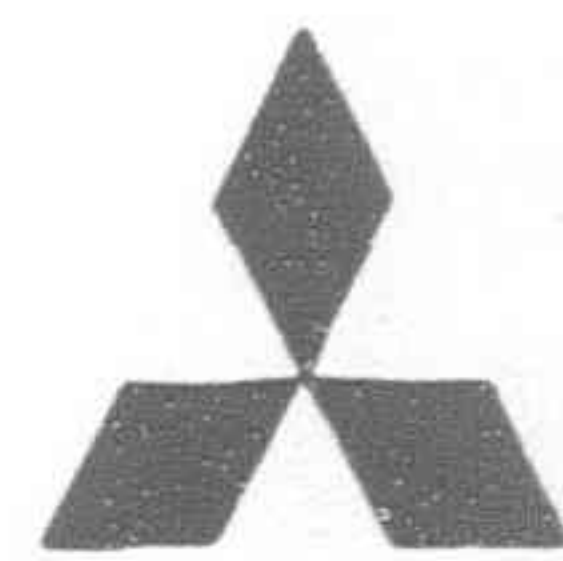
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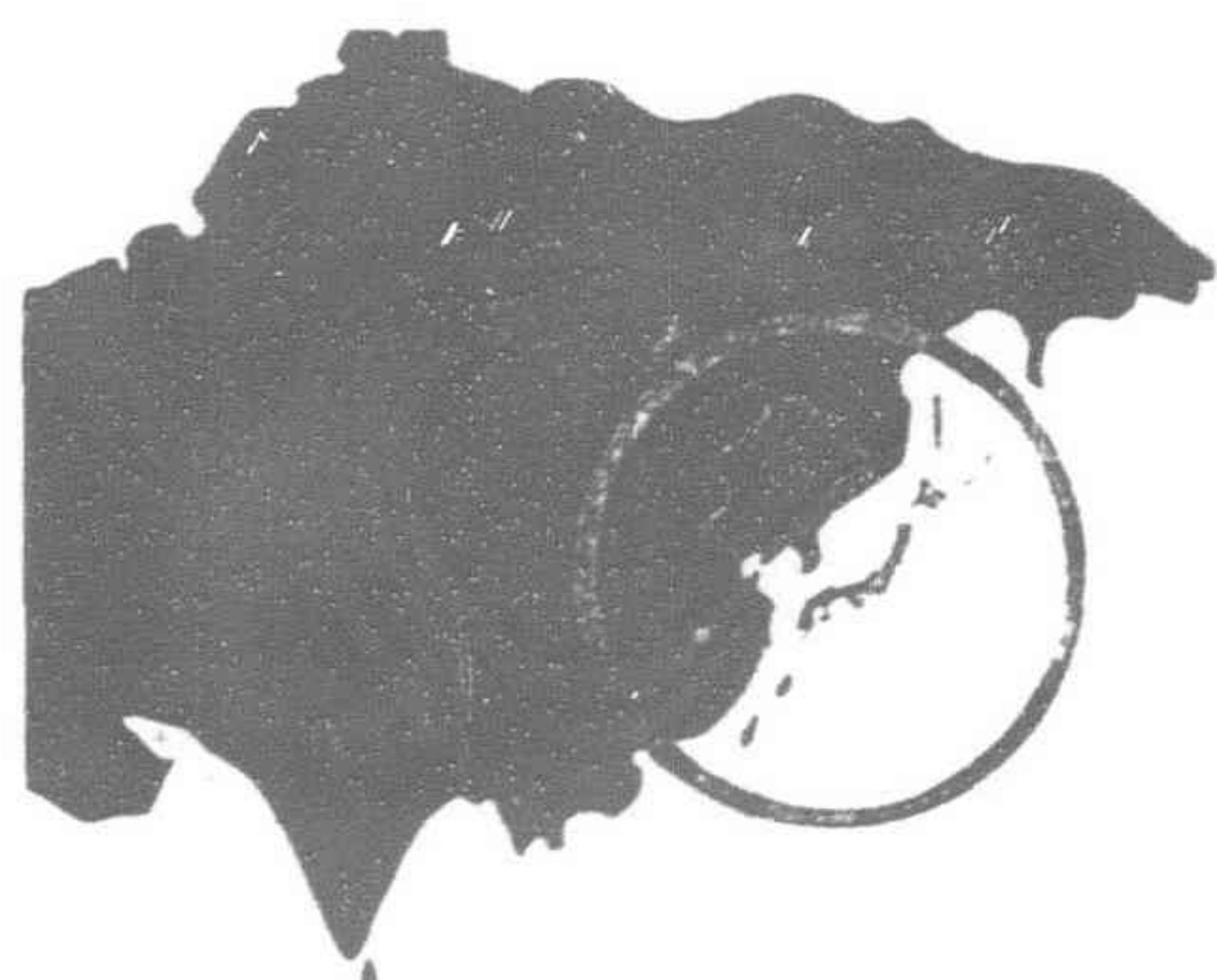
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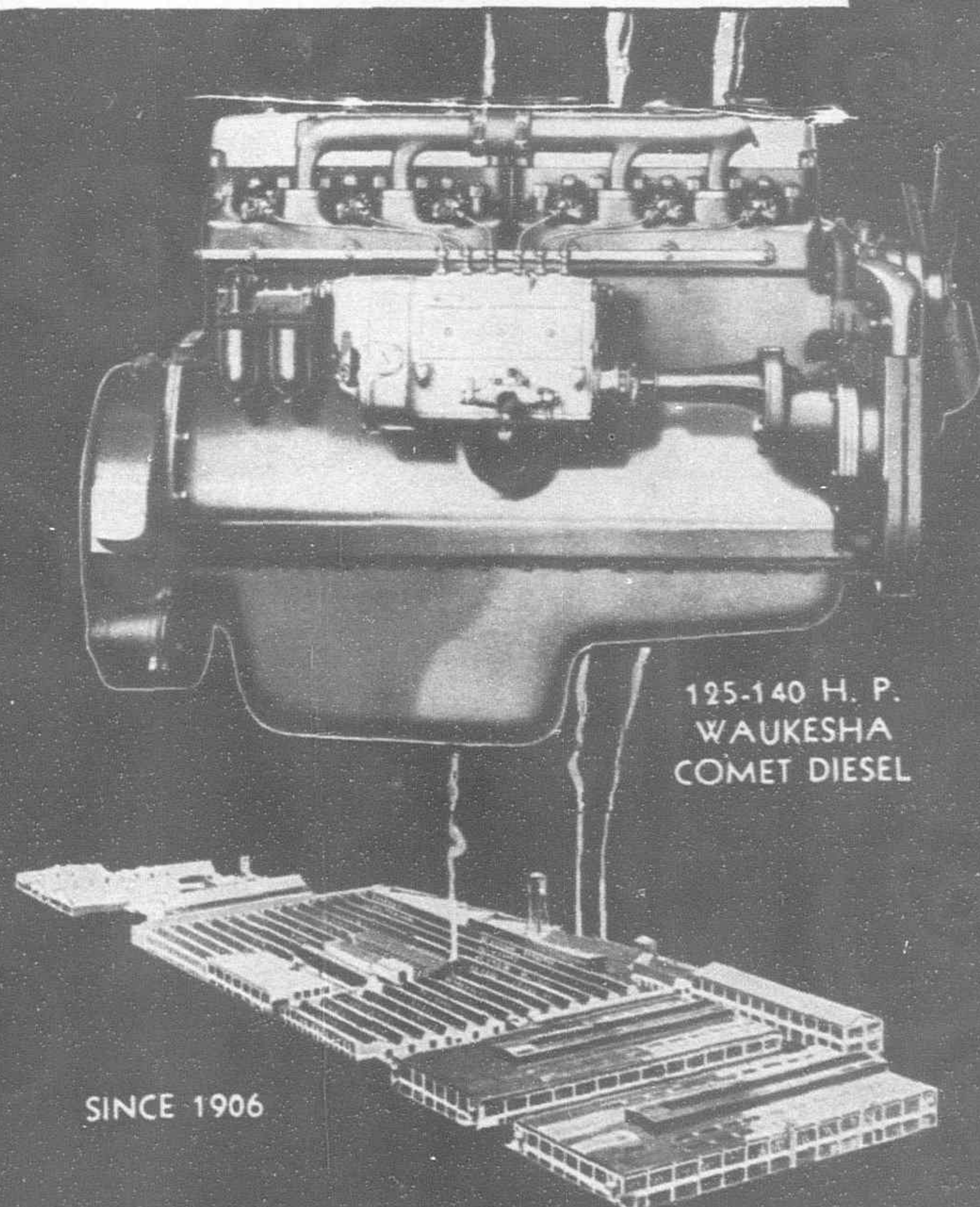
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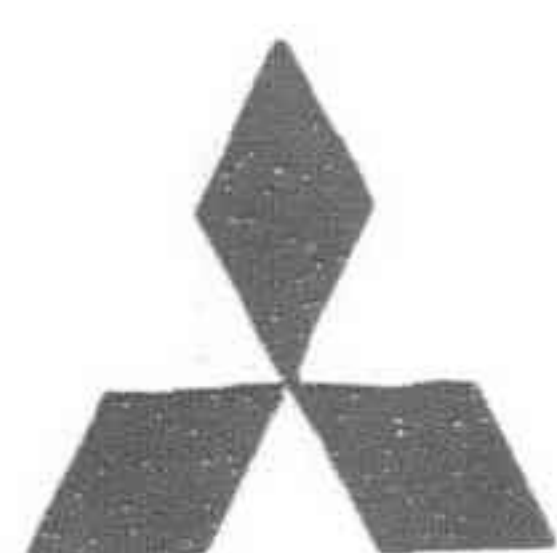
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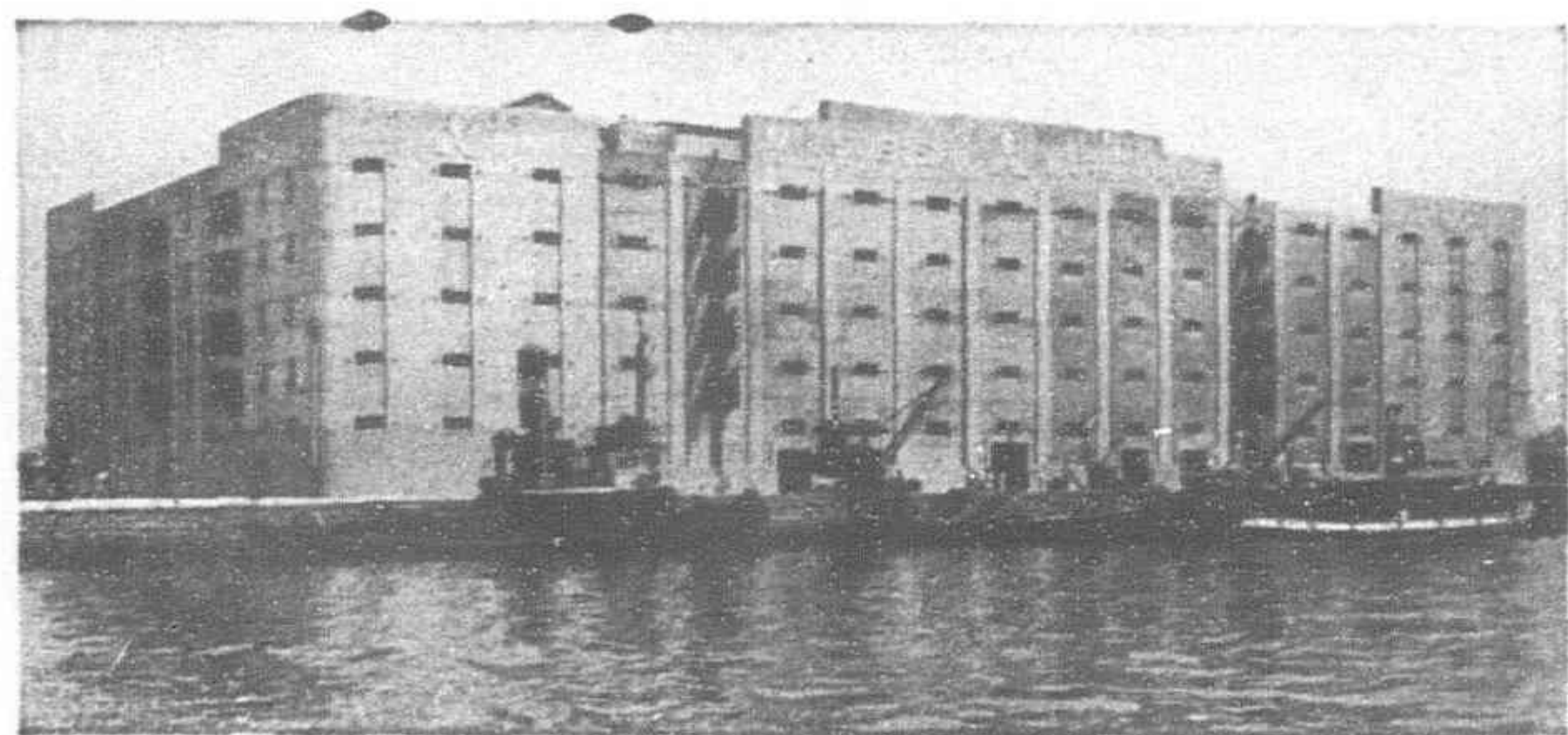
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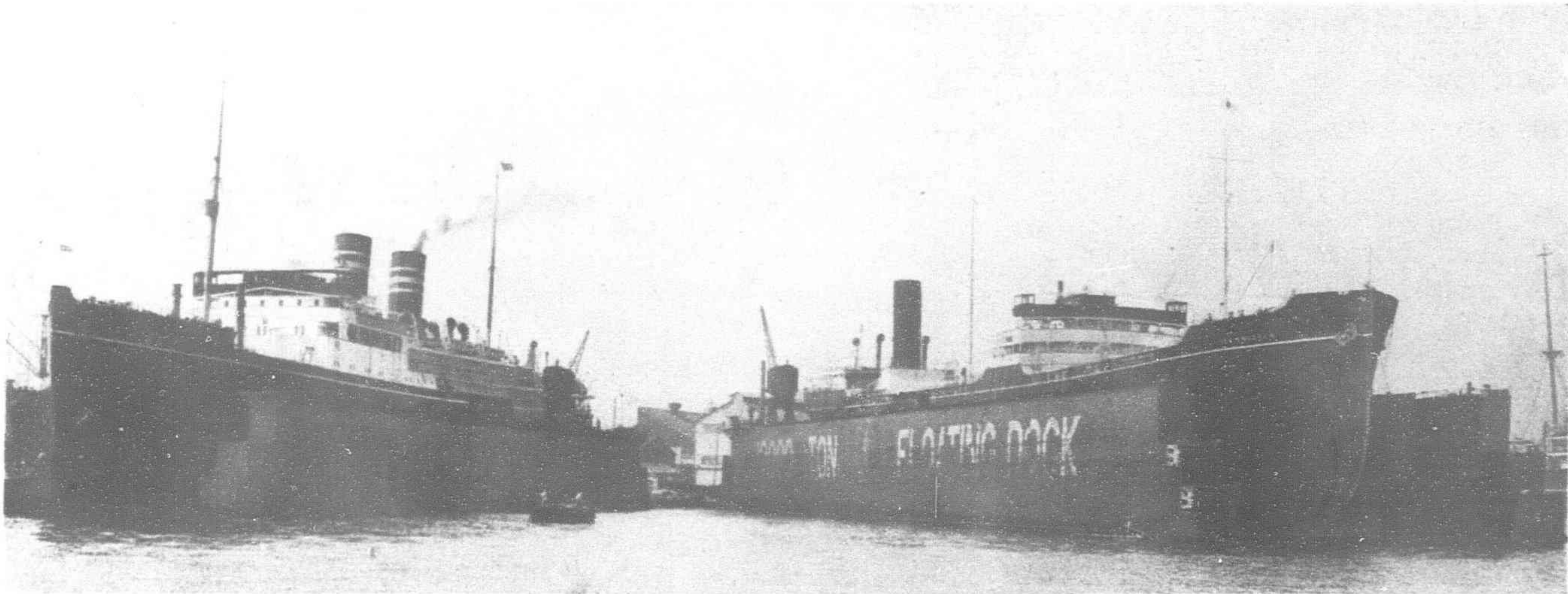
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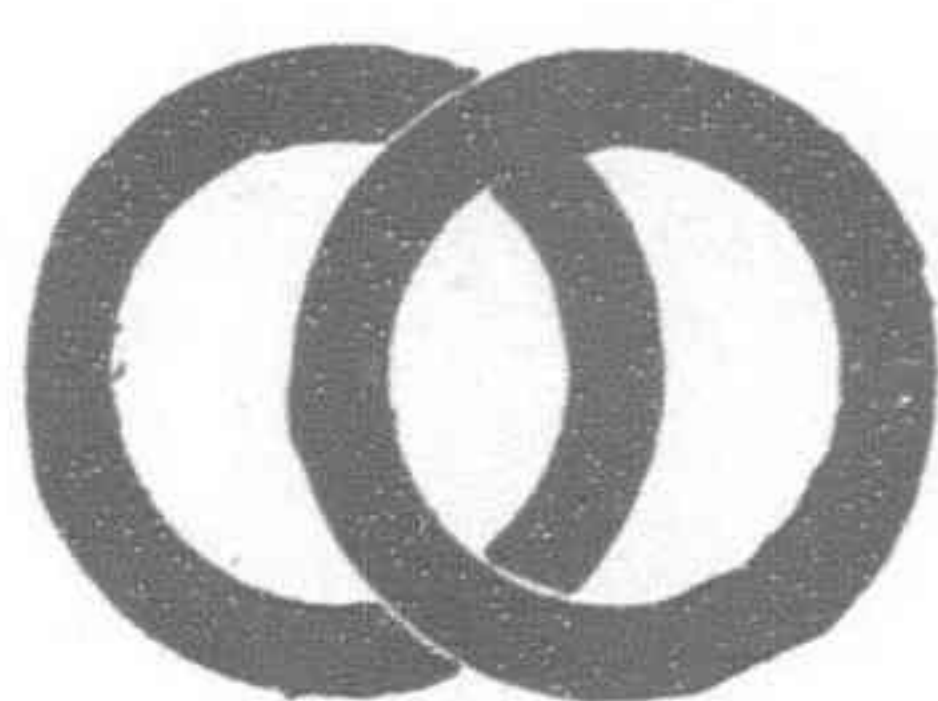
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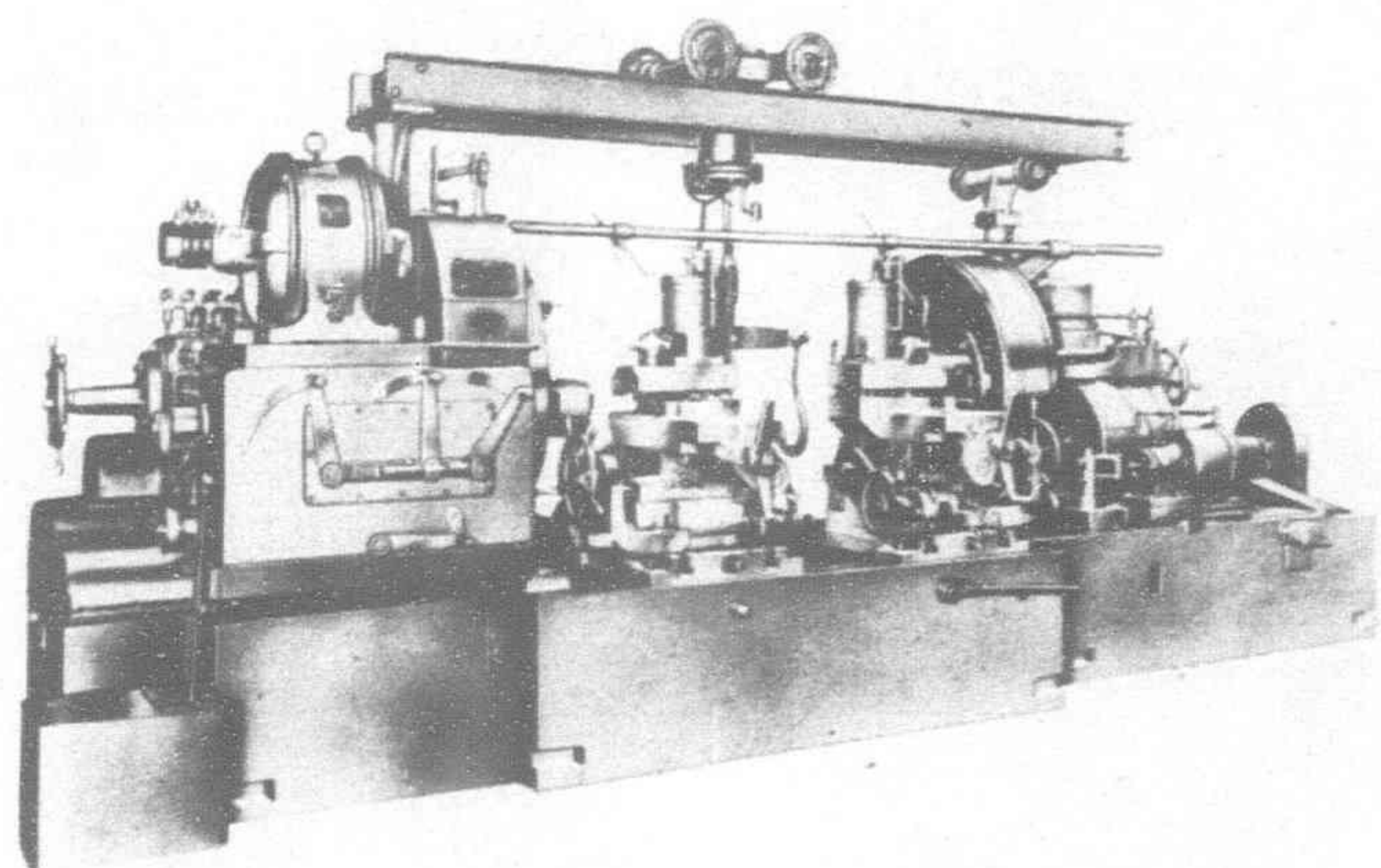
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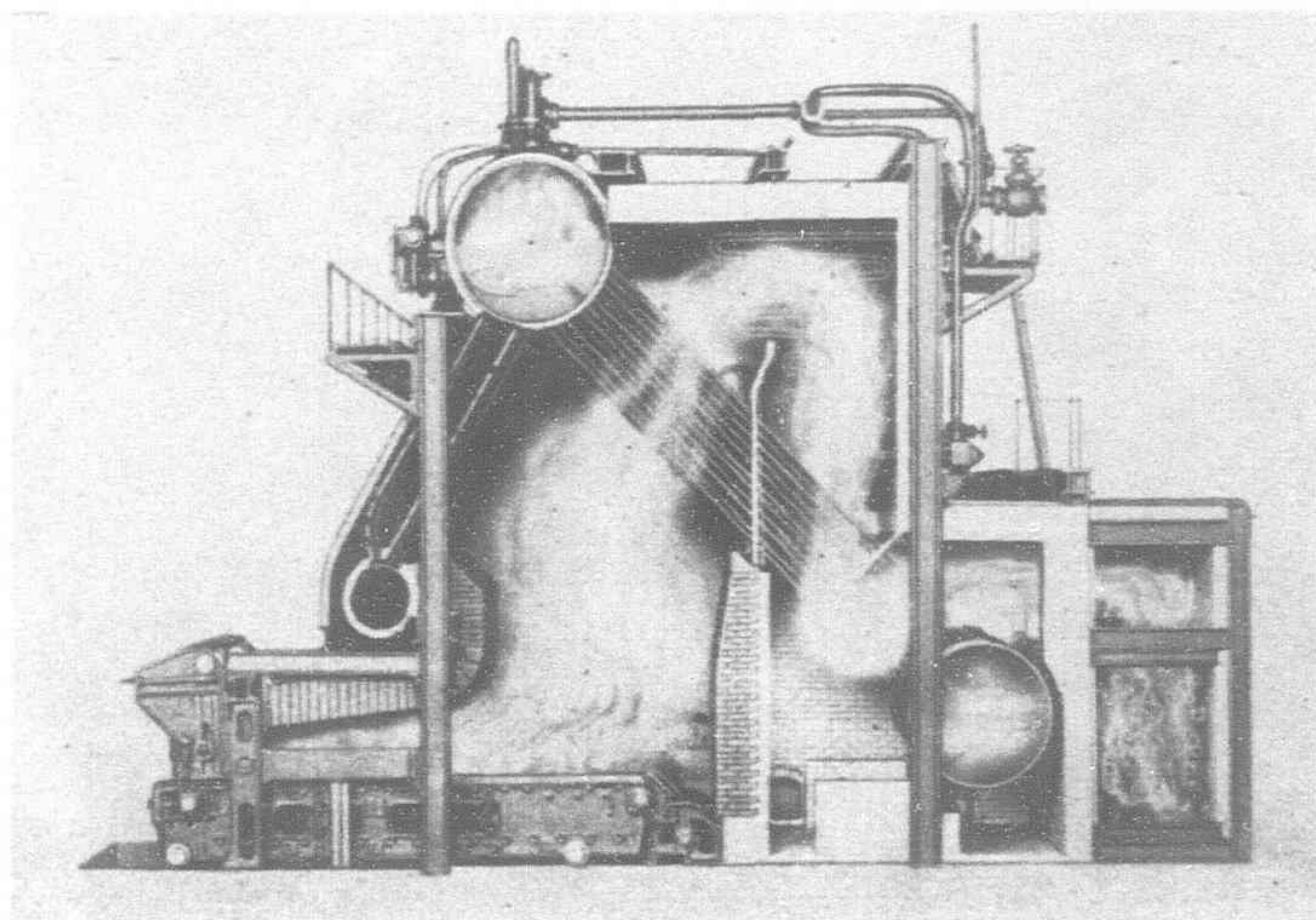
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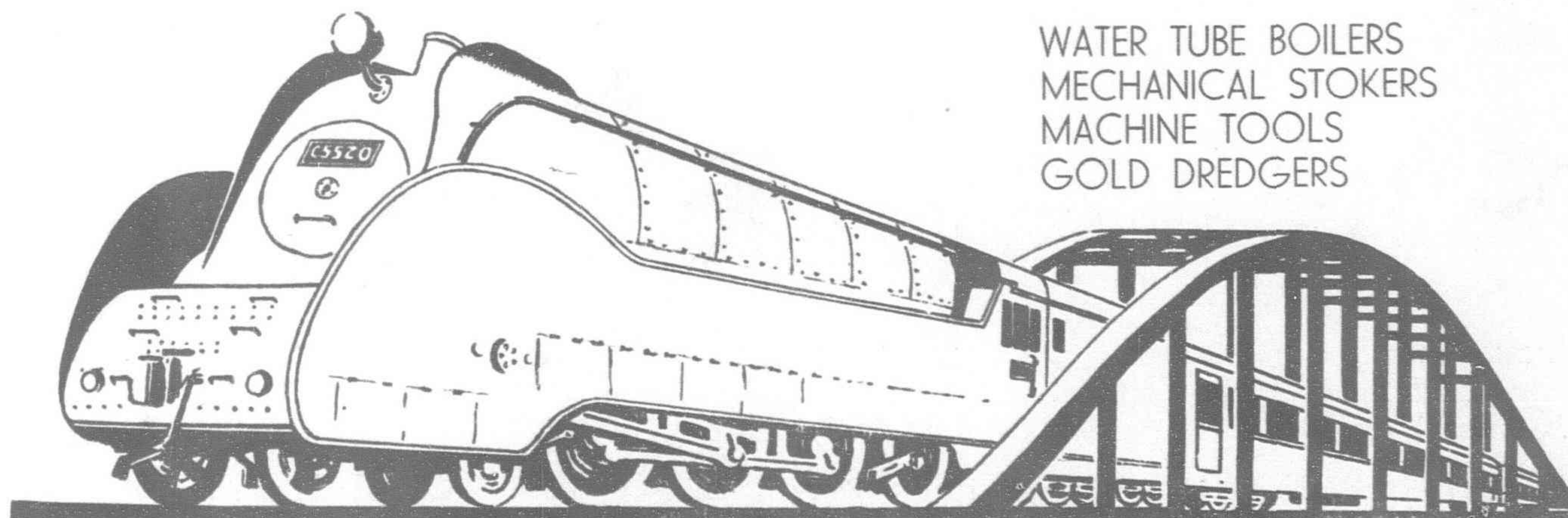
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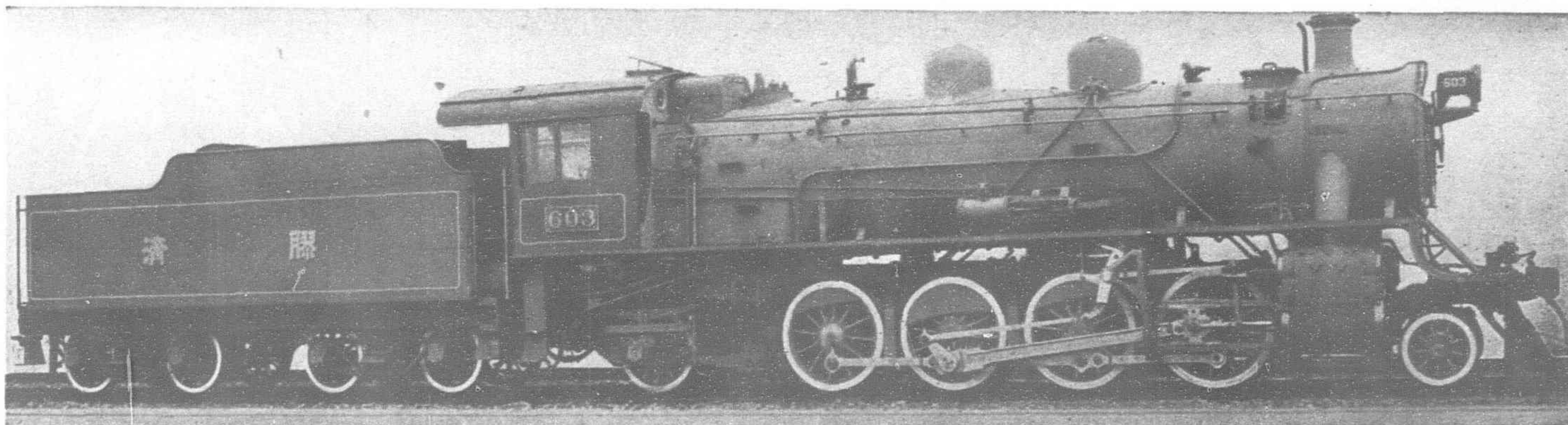
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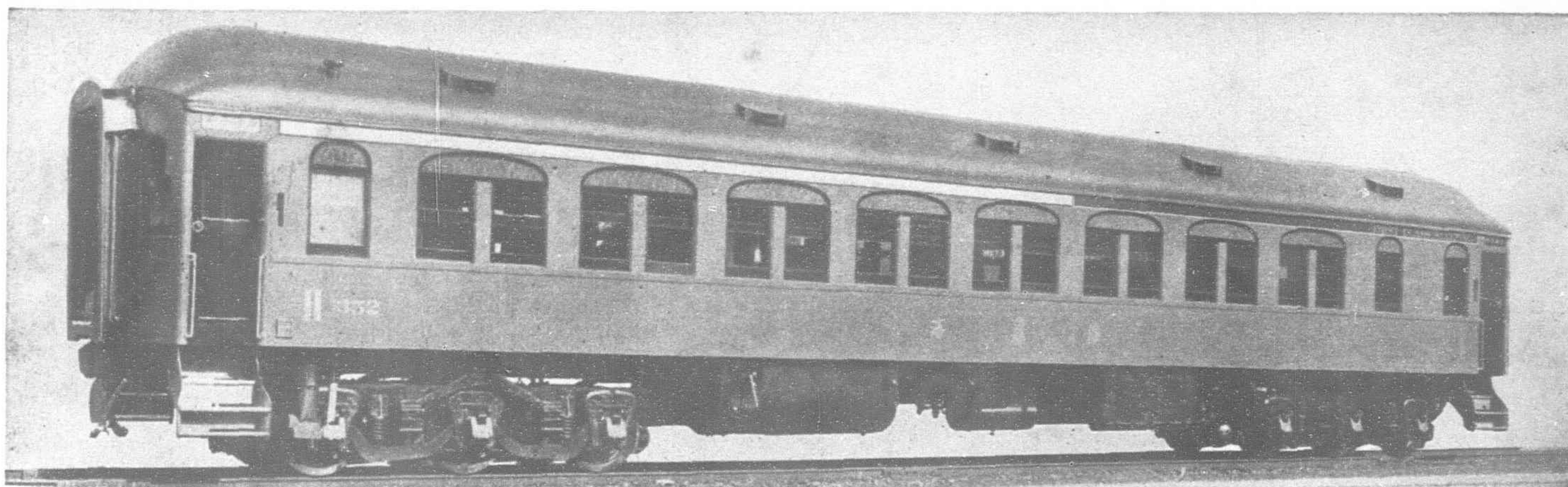
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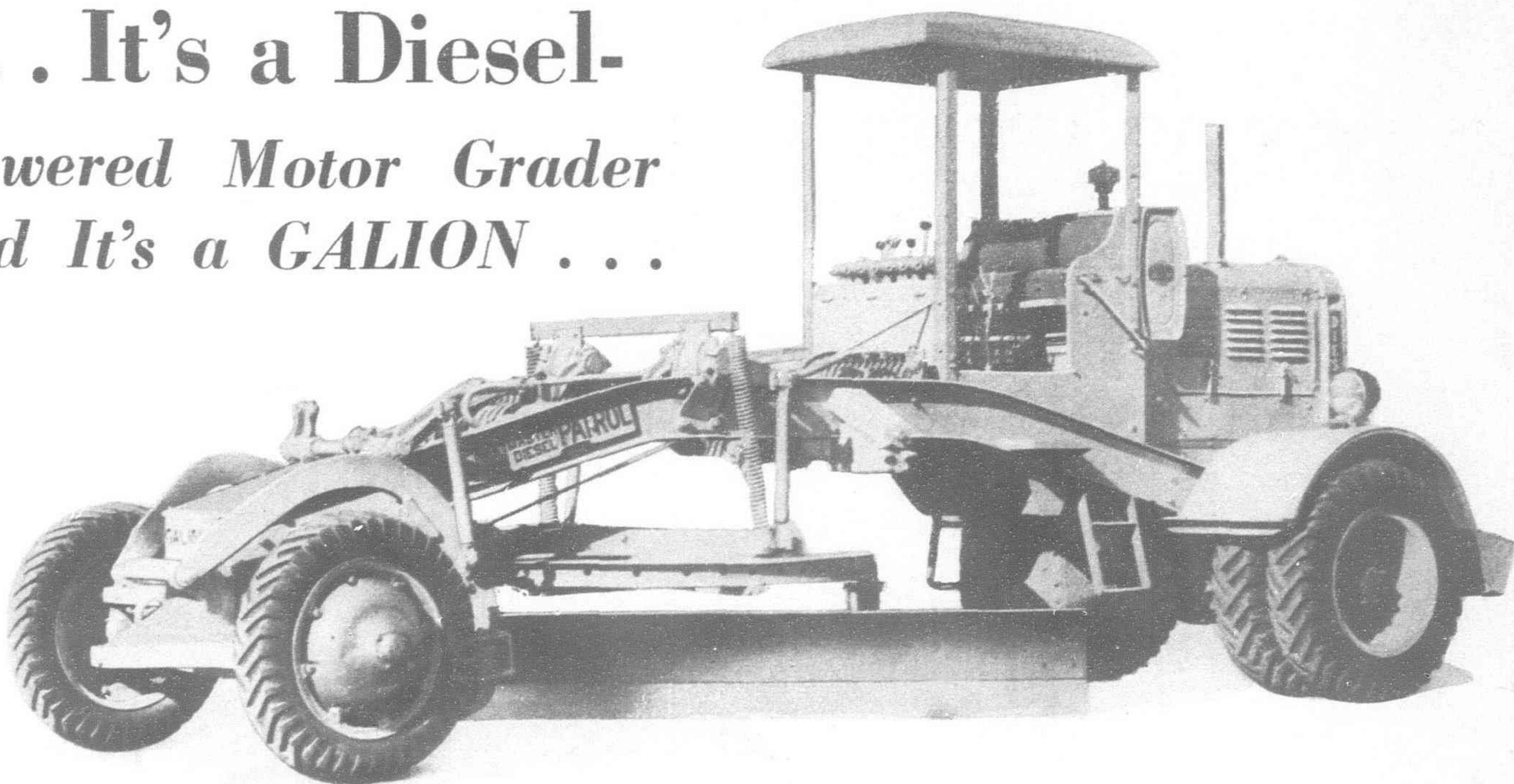
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The author (Mr. Fernand MAURETTE, Assistant Director of the I.L.O.) went to Japan in April 1934 to obtain information about living and working conditions there. He visited twenty-two industrial establishments representing sixteen industries, including the textile industries, which have assumed such an important place in Japanese export trade in recent years, and the sheet glass, pottery and porcelain, match and electrical industries. He summarises facts and opinions derived from official sources, employers' organisations, trade unions and economists, and adds certain opinions which he himself has formed. Tables are given indicating the length of working hours and holidays noted in some of the establishments visited. Reference is also made to wages and to the output of the Japanese worker in the principal Japanese industries.

The final section of the report examines the charge of "social dumping" which has at times been levelled against Japanese industry.

GENEVA, 1934. 70 pp. 8vo.

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GENEVA, 1933. XVI + 413 pp. vo.

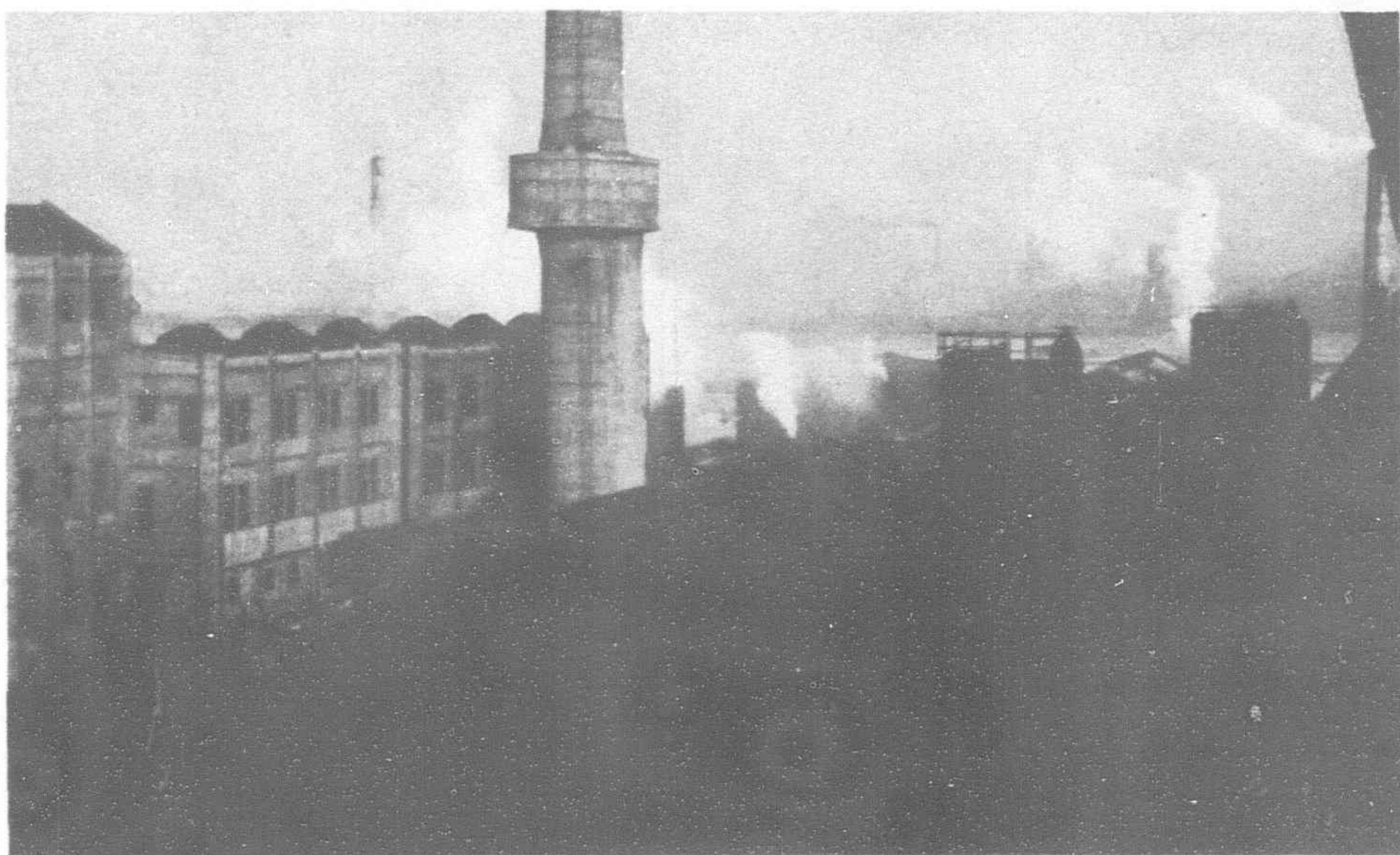
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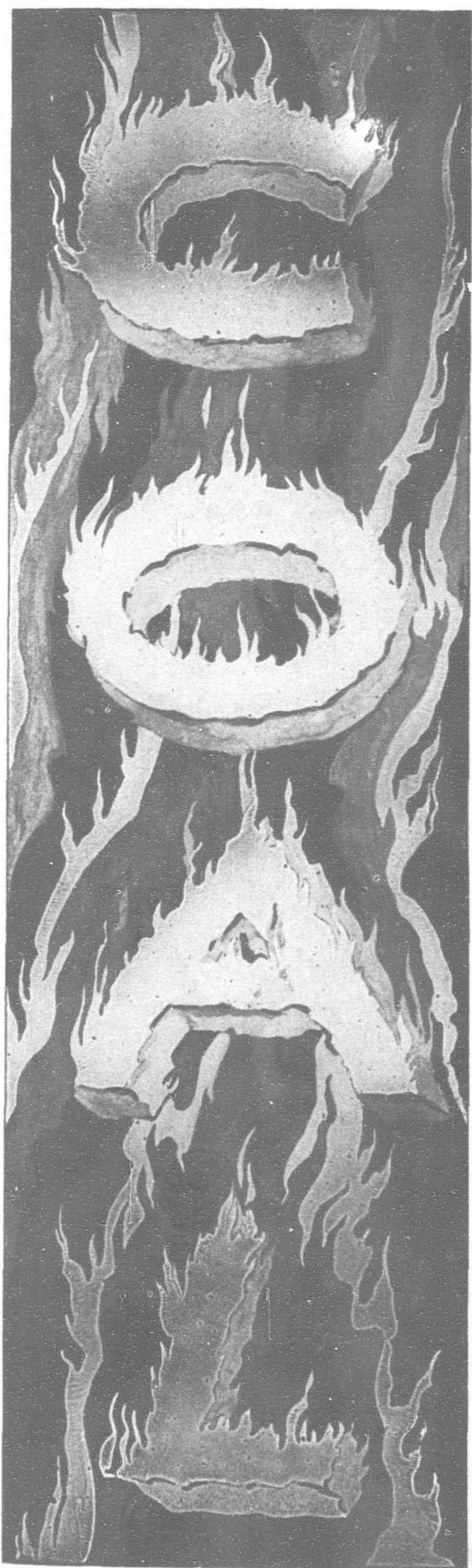
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Number of Looms : 4,604

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Capital Paid-up... .. 5,600,000
Reserve 12,491,045

**Manufacturers of Cotton Thread and
Cotton Cloth, T-Cloth, Drill and
Cotton Shirtings**

Head Office: Nichome, Tamayecho,
Kitaku, Osaka, Japan

President: YUTARO YASHIRO

KURASHIKI BOSEKI KABUSHIKI KAISHA

Established 1887

Capital... ..Yen 17,200,000
Capital Paid-up... .. 12,350,000
Reserve 6,800,000

Cotton Spinners and Weavers

Head Office: Kurashiki, Kurashiki-
shi, Okayama, Japan

President: MAGOSABURO OHARA

NISSHIN BOSEKI KABUSHIKI KAISHA

Established 1907

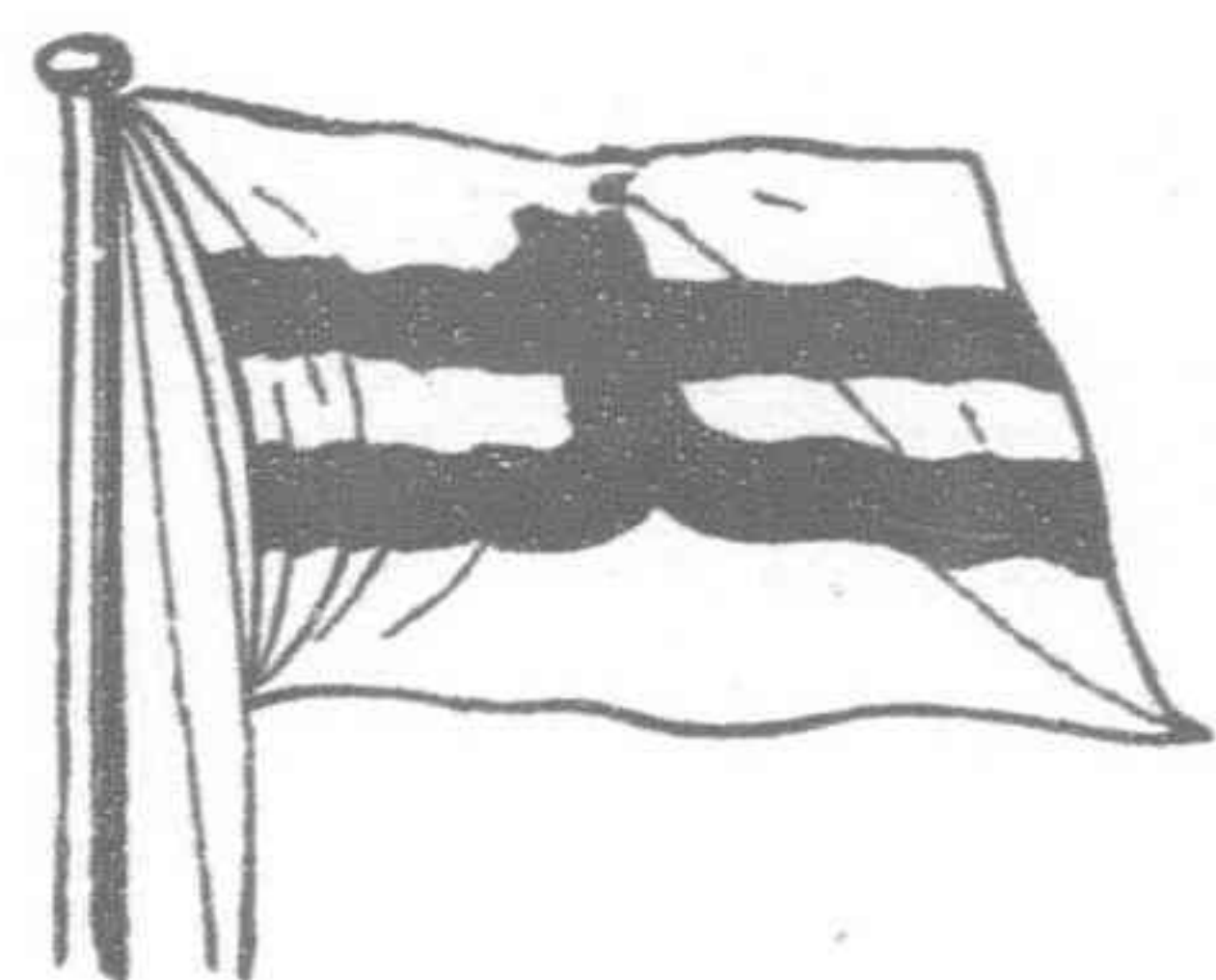
Capital... ..Yen 27,000,000
Capital Paid-up... .. 16,125,000
Reserve 4,880,594

**Manufacturers of Cotton Yarn, Cloth
and Shirtings**

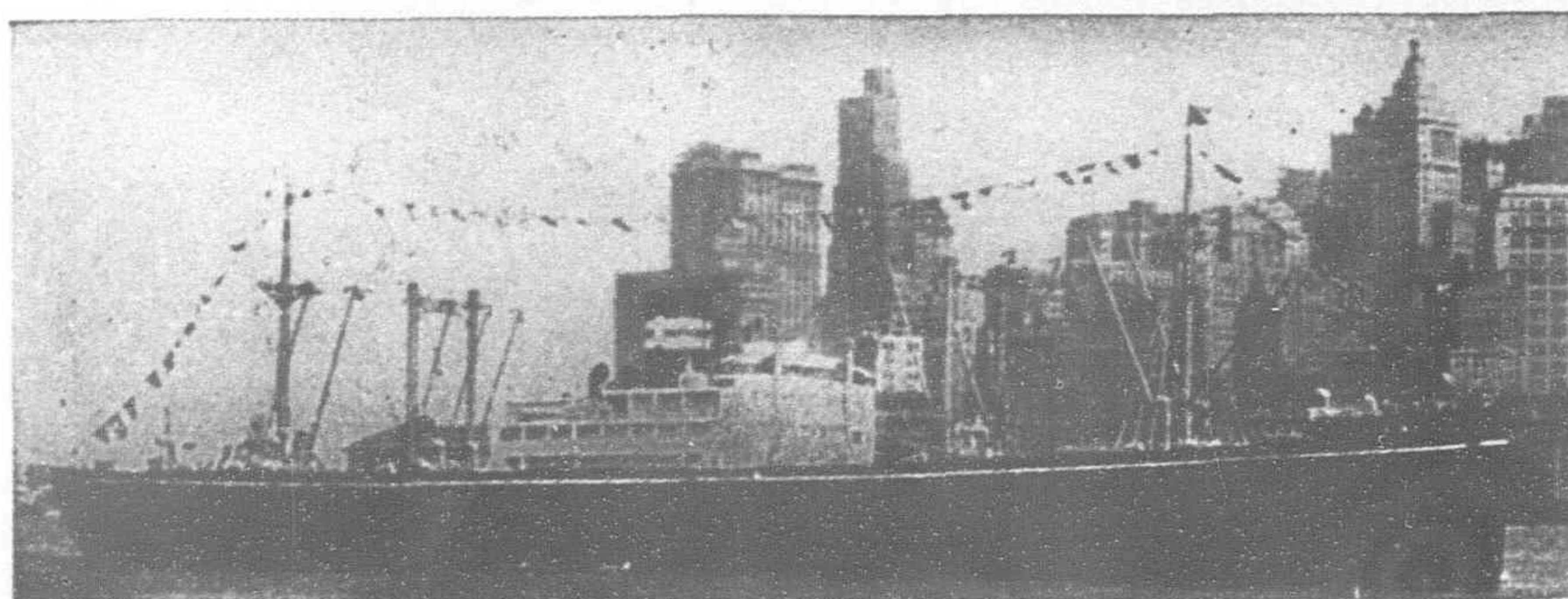
Head Office: Kameido-machi, Mina-
mi-katsushikagori, Tokyofu, Japan

President: SEIJIRO MIYAJIMA

O.S.K. LINE



*50 Mail, Passenger and Freight Services
with a Fleet of 150 Vessels
aggregating 250,000 Tons.*



M.V. Kinai Maru One of Eight Sister Boats on the New York Express Freight Service

NEW YORK LINE EXPRESS SERVICE

New York, Philadelphia,
Boston, Baltimore, Los
Angeles and Panama
Canal—Far East.
FORTNIGHTLY SERVICE

Shanghai—26 Days—New York. New York—41 Days—Shanghai

Shanghai to Foochow, Keelung, Takao, Tsingtao, Tientsin and Dairen
Every 10 Days Service

Principal Regular Ocean Lines

South American Line	-	Monthly	Bombay Line	-	2 times a Month
African Line	-	Monthly	Japan-Calcutta Line	-	2 times a Month
Australian Line	-	Monthly	Saigon-Bangkok Line	-	2 times a Month
South Sea Line	-	2 times a Month	Philippine Line	-	Fortnightly

Chinese Service

Osaka-Dairen Line	-	Daily Sailing	Keelung-Foochow-Amoy Line	3 times a Month
Osaka-Tientsin Line	-	7 times a Month	Keelung-Hongkong Line	- Weekly
Yokohama-Tientsin Line	-	6 times a Month	Takao-Canton Line	- Fortnightly

OFFICES AND AGENTS IN CHINA

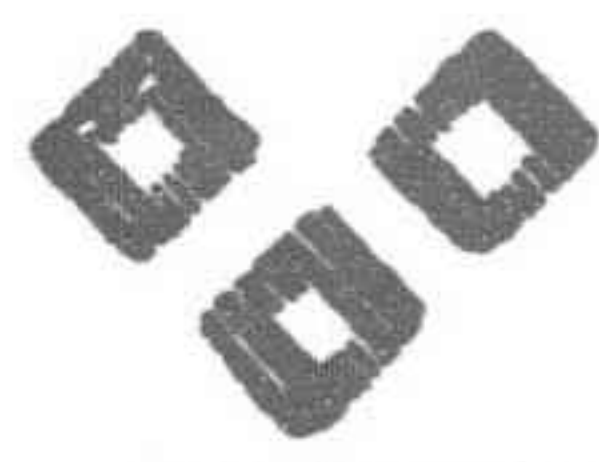
SHANGHAI, HONGKONG, SWATOW, AMOY, CANTON, FOOCHOW, HANKOW, TSINGTAO,
CHEFOO AND DAIREN

橋樑
機器
公司

M



A

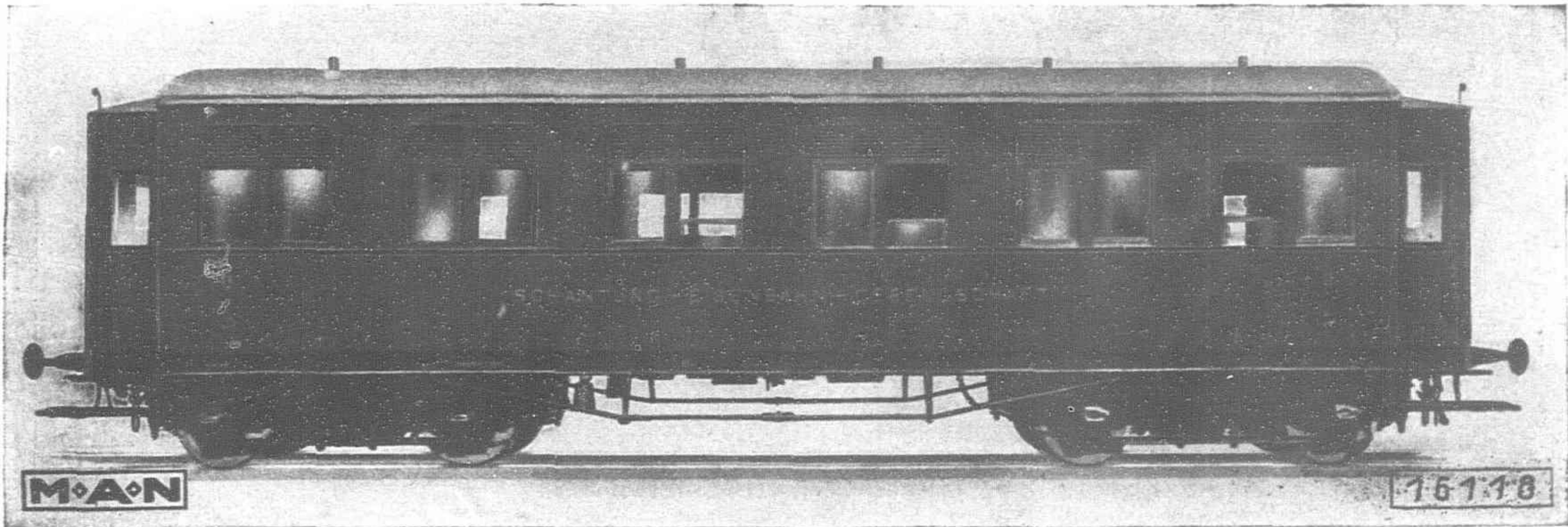


N

恩阿孟

MASCHINENFABRIK AUGSBURG - NÜRNBERG A.G.

WE BUILD RAILWAY CARS OF EVERY DESCRIPTION



For further Particulars apply to:

Gutehoffnungshuette M.A.N. Works

Shanghai Branch:

110 Szechuen Road, Room 79

Agents on the Asiatic Mainland:

Messrs. KUNST & ALBERS, Shanghai, Hankow, Nanking, Taiyuanfu, Tientsin, Canton, Hongkong

ATTWATER & SONS

ESTABLISHED 1868

Hopwood Street Mills, PRESTON, ENGLAND

MICA and MICANITE

IN ALL FORMS AND QUALITIES.

BAKELITE SHEETS, TUBES, BOBBINS, VARNISH and RESIN for OIL SWITCH GEAR and TRANSFORMERS. VULCANISED FIBRE, SHEETS, TUBES and RODS. PEERLESS LEATHEROID INSULATION EMPIRE CLOTH and TAPES. COTTON and also ASBESTOS DYNAMO TAPES.

PRESSPAHN AND
FULLERBOARD IN
SHEET AND ROLLS



EBONITE AND ALL INSU-
LATING MATERIAL FOR
ELECTRICAL ENGINEERS



JAPAN

Dear Friends :

You are cordially invited to our lovely all-year-round resorts—one of the best pleasure-grounds in the Orient—this year. Please come with your friends and enjoy your holidays with us.

FOR PARTICULARS
APPLY TO:—

JAPAN TOURIST BUREAU

THOS. COOK & SON LTD.

AMERICAN EXPRESS CO.

AND

ALL TOURIST AGENCIES



BOARD OF TOURIST INDUSTRY JAPANESE GOVERNMENT RAILWAYS

Hongkong and Shanghai Banking Corporation

(Incorporated in the Colony of Hongkong. The liability of Members is limited to the extent and in manner prescribed by Ordinance No. 6 of 1929 of the Colony)

Capital: Authorised Capital	\$50,000,000	Reserve Funds: Hongkong Currenc	Reserve Fund	\$10,000,000
Issued and fully paid-up	\$20,000,000	Sterling Reserve Fund		£ 6,500,000
		Reserve Liability of Proprietors ..		\$20,000,000

Board of Directors

Hon. Mr. J. J. PATERSON, Chairman
 G. MISKIN, Esq., Deputy Chairman
 A. H. COMPTON, Esq.
 Hon. Mr. S. H. DODWELL
 Hon. Mr. M. T. JOHNSON
 J. R. MASSON, Esq.
 K. S. MORRISON, Esq.
 T. E. PEARCE, Esq.
 A. L. SHIELDS, Esq.

Head Office: HONGKONG

Chief Manager:
V. M. GRAYBURN, Esq., Hongkong

London Branch:
9 Gracechurch Street, E.C.3

Shanghai Branch: 12 The Bund
 Sub-Agency: 27 Broadway

Branches and Agencies:

AMOY	ILOILO	NEW YORK
BANGKOK	IPOH	PEIPING
BATAVIA	JOHORE	PENANG
BOMBAY	KOBE	RANGOON
CALCUTTA	KOWLOON	SAIGON
CANTON	(Hongkong)	S. FRANCISCO
CHEFOO	KUALA	SHANGHAI
COLOMBO	LUMPUR	SINGAPORE
DAIREN	LONDON	SOURABAYA
FOOCHOW	LYONS	SUNGEIPATANI
HAIPHONG	MALACCA	TIENTSIN
HAMBURG	MANILA	TOKYO
HANKOW	MOUKDEN	TSINGTAO
HARBIN	MUAR(Johore)	YOKOHAMA

Interest allowed on Current Accounts and on Fixed Deposits according to arrangement.

Local Bills Discounted. Credits granted on approved Securities and every description of Banking and Exchange business transacted. Drafts granted on London and the chief commercial places in Europe, India, Australia, Africa, China, Japan and America. Safe Deposit Boxes to rent. Terms on application.

SAVINGS BANK OFFICE

Accounts will be kept in Dollars Local Currency.

Deposits of less than \$1 will not be received.

Not more than \$200 will be received during one month from any single Depositor.

Interest at the rate of 2½% per annum will be allowed upon the monthly minimum balance.

The maximum balance on which interest will be allowed is \$5,000.

Deposits may be withdrawn on Demand.

Depositors will be provided with Pass Books in which all transactions will be entered. Pass Books must be presented when paying in or withdrawing money.

Savings Bank accounts also kept in Sterling and U.S. Dollars. Terms on application.

Office Hours—10 a.m. to 3 p.m. Saturdays 10 a.m. to Noon.

A. S. HENCHMAN, Manager.



The Kawasaki-One Hundredth Bank, Ltd.

HEAD OFFICE: YOROZU-CHO, TOKYO

Phone: Nihombashi 141, 3105

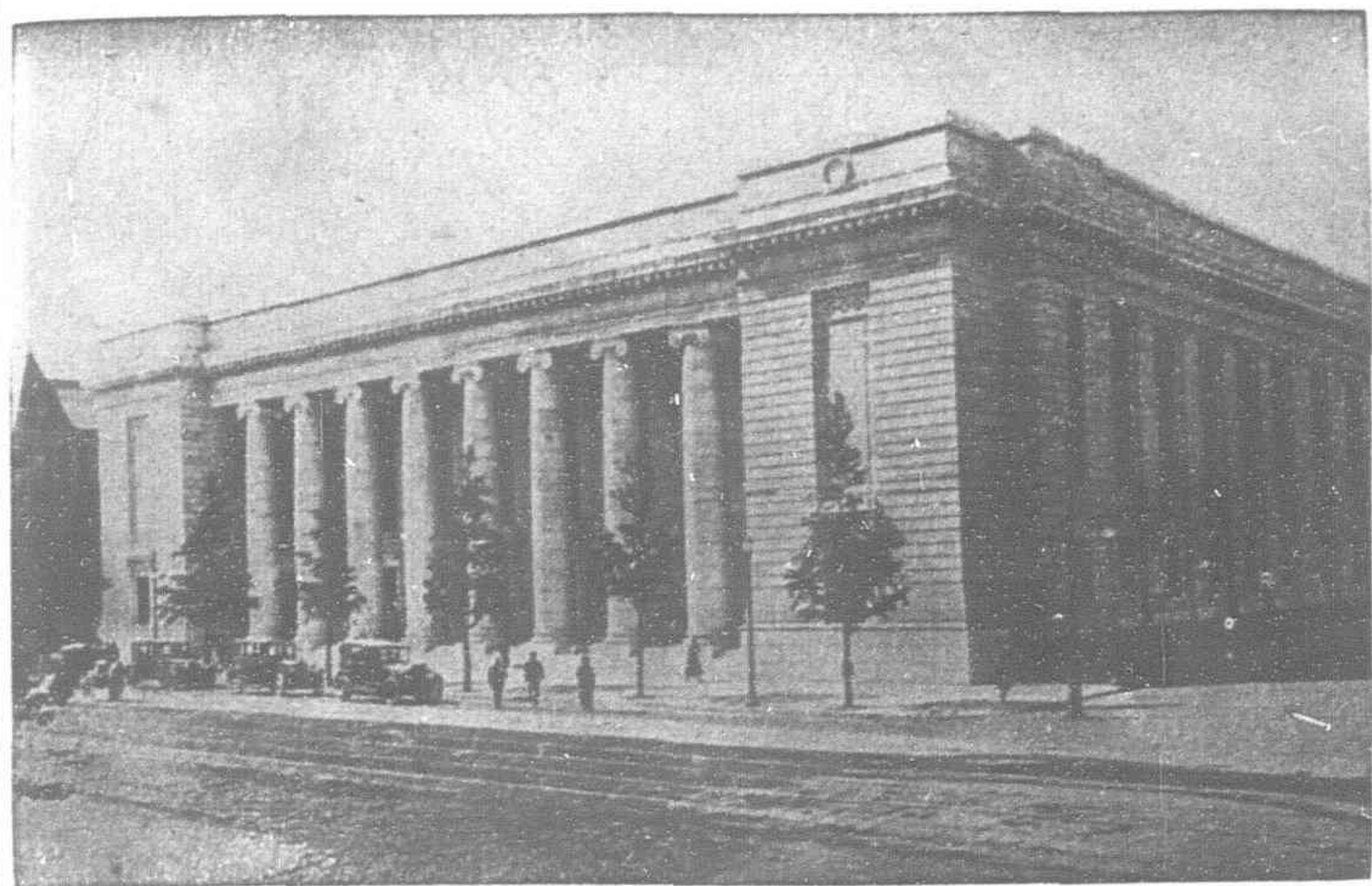
HOSHINO SHO, President

Special facilities offered for foreign residents and corporations in Japan

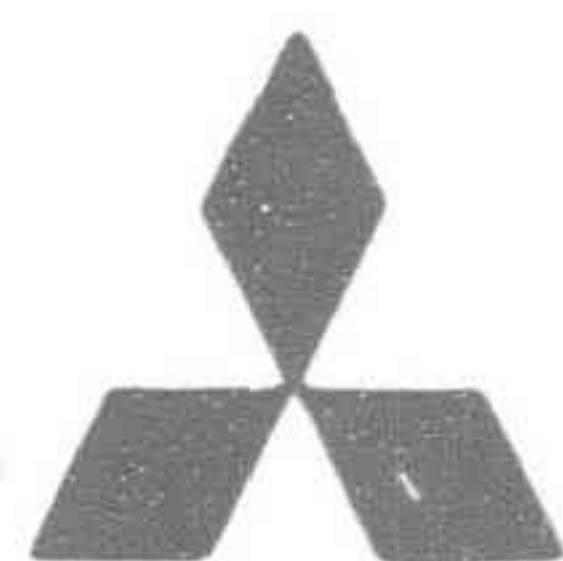
Interest allowed on current and time deposits. Safe deposit box rented

BRANCHES AND AGENCIES:

Yokohama, Kobe, Kyoto, Osaka and 78 others in principal cities in Japan



Mitsubishi Bank, Tokyo



THE MITSUBISHI BANK, LIMITED

CAPITAL SUBSCRIBED - Yen 100,000,000
CAPITAL PAID-UP - Yen 62,500,000

CHAIRMAN:

Mr. Kiyoshi Sejimo

MANAGING DIRECTORS:

Mr. Takeo Kato Mr. Sobun Yamamuro
Mr. Hideya Maruyama

HEAD OFFICE:

No. 5, Marunouchi, Nichome, Kojimachi-ku,
Tokyo.

BRANCHES HOME:

Eitaibashi (Tokyo), Tokio Kaijo Building (Tokyo),
Marunouchi Building (Tokyo), Nihonbashi
(Tokyo), Yotsuya (Tokyo), Komagome (Tokyo),
Nihonbashi-Toricho (Tokyo), Kanda (Tokyo),
Shinagawa (Tokyo), Omori (Tokyo), Osaka,
Nakanoshima (Osaka), Senba (Osaka), Nishinaga-
hori (Osaka), Kobe, Sannomiya (Kobe), Kyoto,
Nagoya, Otaru.

BRANCHES OVERSEAS:

Shanghai Office : No. 93, Canton Road, Shanghai.
London Office : No. 3, Birchin Lane, Cornhill,
London, E.C.3.
New York Office : No. 120, Broadway, New York.



Mitsui Bank, Tokyo



THE MITSUI BANK, LTD.

The Oldest Bank in Japan, Founded in 1673

Capital Subscribed.....Y. 100,000,000
Capital Paid-Up.....Y. 60,000,000
Reserve Funds.....Y. 56,800,000

HEAD OFFICE: TOKYO

No. 1 Muromachi 2-Chome, Nihonbashi-ku

Home Branches:

FUKUOKA, HIROSHIMA, KOBE, KYOTO,
MARUNOUCHI (Tokyo), MOJI, NAGOYA,
NAGOYA - KAMIMAETSU, NIHONBASHI
(Tokyo), OSAKA, OSAKA - DOJIMA, OSAKA -
KAWAGUCHI, OSAKA - NISHI, OSAKA -
SEMBA, OTARU, WAKAMATSU (Kyushu),
YOKOHAMA.

Foreign Branches:

Bombay, London, New York, Shanghai,
Sourabaya.

London Bankers:

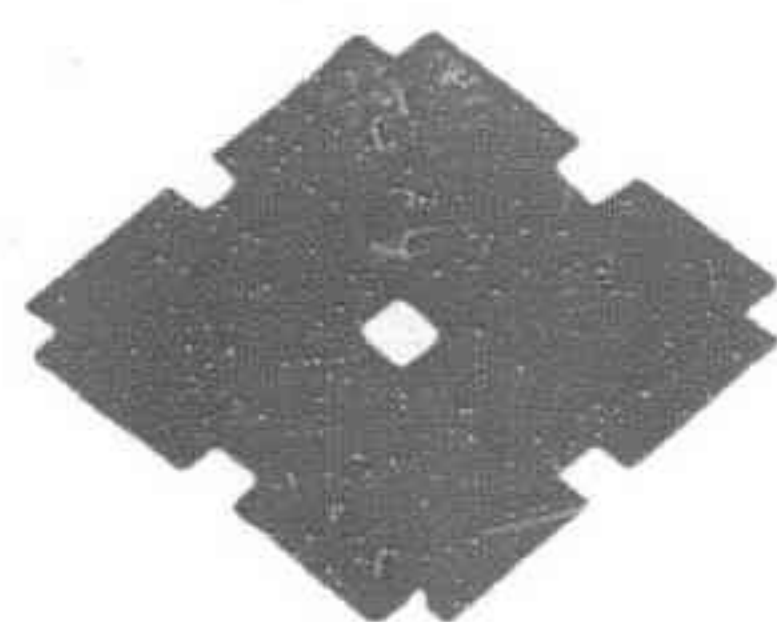
Barclays Bank, Ltd. Midland Bank, Ltd.

New York Bankers:

Bankers Trust Co. Chase National Bank.
National City Bank of New York.

PAID-UP CAPITAL

YEN 150,000,000



THE SUMITOMO GOSHI-KAISHA

OSAKA, JAPAN

A Holding Company for Business and Industrial Enterprises of the
Sumitomo Interests and Owners of Silver and Gold Mines, Forestlands, Etc.

OFFICES AND DEPARTMENTS

Mining Offices	Konomai & Ohgayu	Sales Departments...	Tokyo, Yokosuka, Nagoya, Kobe,
Forestry Department	Osaka		Kure, Fukuoka, Keijo and Shanghai

The Sumitomo Metal Industries, Ltd.

OSAKA, JAPAN

Subscribed Capital: Yen 50,000,000

The Sumitomo Electric Wire & Cable Works, Ltd.

OSAKA, JAPAN

Subscribed Capital: Yen 15,000,000

The Sumitomo Chemical Co., Ltd.

Subscribed Capital: Yen 20,000,000

Head Office: Osaka, Japan Works: Niihama, Iyo, Japan

The Sumitomo Machinery Works, Ltd.

Subscribed Capital: Yen 5,000,000

Head Office and Works: Niihama, Iyo, Japan

The Sumitomo Besshi Mine, Limited

Paid-up Capital: Yen 15,000,000

Head Office: Niihama, Iyo, Japan Branch: Osaka, Japan

The Sumitomo Warehouse Company, Limited

Paid-up Capital: Yen 15,000,000

Head Office: Osaka, Japan Branches: Osaka, Kobe & Tokyo, Japan

The Sumitomo Trust Company, Limited

Subscribed Capital: Yen 20,000,000

Head Office: Osaka, Japan Branches: Tokyo & Fukuoka, Japan

The Sumitomo Life Insurance Company, Limited

OSAKA, JAPAN

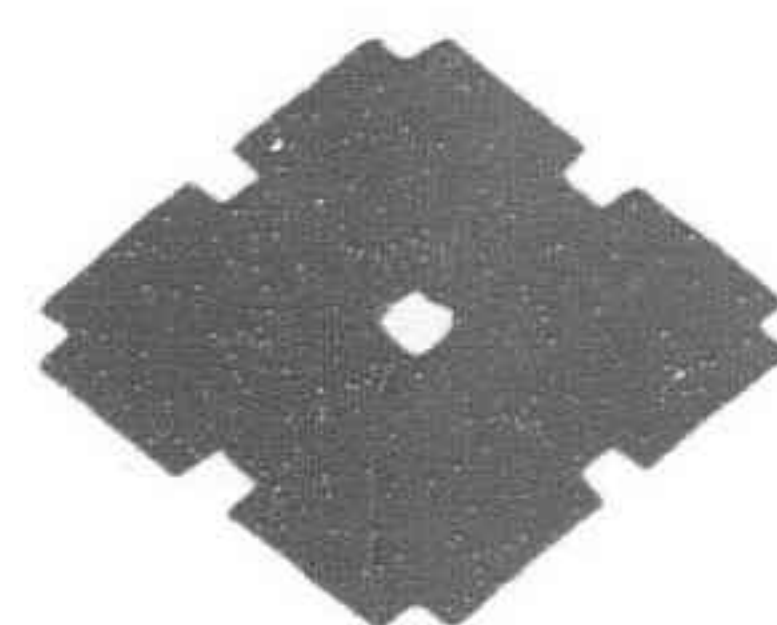
Subscribed Capital: Yen 1,500,000

The Sumitomo Collieries, Limited

Paid-up Capital: Yen 12,000,000

Head Office: Osaka, Japan Branches: Wakamatsu & Otaru, Japan

ESTABLISHED : 1895



INCORPORATED : 1912

THE SUMITOMO BANK, LTD.

OSAKA, JAPAN

Subscribed Capital Yen 70,000,000

Paid-up Capital Yen 50,000,000

Reserve Funds Yen 47,410,000

DIRECTORS:

N. YATSUSHIRO, Esq. ..	Chairman, Board of Directors and
	Chief Managing Director
K. OHDAIRA, Esq. ..	Managing Director
H. OKAHASHI, Esq. ..	" "
K. OHSHIMA, Esq. ..	" "
M. SOGAME, Esq. ..	" "

BARON K. SUMITOMO	Director
K. HORI, Esq.	"
M. OGURA, Esq.	"
S. IMAMURA, Esq.	"

Home Branches : Osaka, Tokyo, Yokohama, Nagoya, Kyoto,
Kobe, Wakayama, Okayama, Onomichi, Niihama, Kure,
Hiroshima, Yanai, Shimonoseki, Moji, Kokura, Wakamatsu,
Fukuoka, Kurume and Kumamoto.

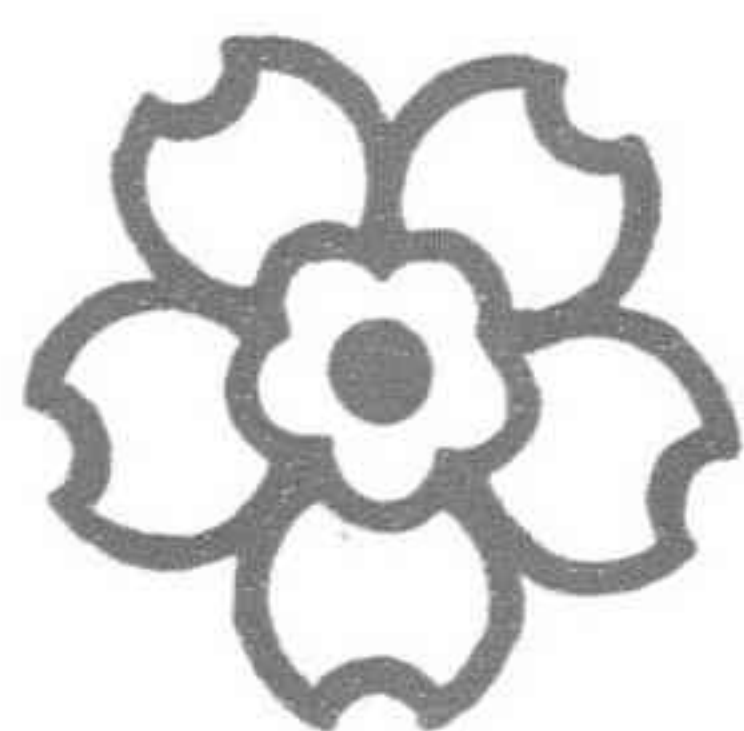
Offices in Pacific Liners: M. S. "Asama Maru," M. S.
"Chichibu Maru" and M. S. "Tatsuta Maru."

Foreign Branches: London, New York, San Francisco, Los
Angeles, and Shanghai.

Affiliated Banks: The Sumitomo Bank of Hawaii, Honolulu.
The Sumitomo Bank of Seattle, Seattle. The Sumitomo
Bank of California, Sacramento, Cal.

Correspondents: Maintained in all important places at home and
abroad.

The Bank buys, sells and receives for collection Drafts and Telegraphic Transfers; issues Commercial and Travellers' Letters of Credit
available in all important parts of the world, and acts as Trustee for Mortgage Bonds, besides doing General Banking Business.



The Bank of Chosen

Capital Subscribed - - - Yen 40,000,000
 Capital Paid-up - - - Yen 25,000,000

Governor: Y. Matsuda, Esq.

Directors:

J. Matsubara, Esq.

M. Irobe, Esq.

Head Office: Keijo (Seoul) (Korea)

FOREIGN DEPARTMENT (TOKYO)

(All communications relating to correspondence arrangements and the Bank's general foreign business to be addressed to the Foreign Department)

Branch Offices:

Japan Proper—Tokyo, Osaka, Kobe, Shimonoseki
 Korea—Chemulpo, Pyengyang, Fusan, Wonsan, Taiku, Chinnampo, Kunsan, Mokpo, Chungjin
 Manchuria—Antung, Mukden, New Town (Mukden), Dairen, Yingkow (Newchwang), Changchun, Harbin, Tiehling, Liaoyang, Ryojun, Kaiyuan, Chengchiatun, Szupingchieh, Fuchiatien, Lung-chingtsun and six other minor offices
 China Proper—Shanghai, Tientsin, Tsingtao

NEW YORK AGENCY:

165 Broadway, New York City

LONDON REPRESENTATIVE:

Palmerston House, 34 Old Broad Street,
 London, E.C. 2

Correspondents:

San Francisco, Seattle, New York, London, Paris and
 in Other Commercial Centers throughout the World



Industrial Bank of Japan, Limited

(NIPPON KOGYO GINKO)

Established by the Japanese Government by virtue of a
 Special Enactment of Imperial Diet

Capital Subscribed - - - Yen 80,000,000

Head Office: 8, 1-chome Marunouchi, Tokyo.

Cables: "Kogin," Tokyo

BRANCHES:

Tokyo: Nihonbashi Osaka: Koraibashi
 Kobe: Nishimachi Nagoya: Minaminagashima-cho
 Fukuoka: No. 80 Tenjincho.
 Telephone: Fukuoka 1080; 6010

TOYOTARO FUKI, Esq., *President*

DIRECTORS:

ICHIMATSU HORAI, Esq. TARO KIMIMORI, Esq.
 KOICHI KAWAKAMI, Esq. KOTAKE SHIGERU, Esq.

AUDITORS:

COUNT YOSHINORI FUTAARA
 TEIZO IWASA, Esq.
 NAOICHI TANAKA, Esq.

All descriptions of general banking, exchange, both foreign and domestic, and trust and corporation financial business transacted.

Correspondents in the principal cities at home, and in London, Paris, New York, and San Francisco.

Business Transacted:

- 1.—Loans on the security of public bonds, of debentures and shares, estates (Zaidan), specified land and buildings.
- 2.—Subscription and underwriting public bonds or debentures.
- 3.—Deposits and safe custody of valuables.
- 4.—Trust company business.
- 5.—Discounting of bills.
- 6.—Foreign exchange business.
- 7.—Other banking business sanctioned by the Minister of State for Finance in accordance with Law of Ordinance.



THE BANK OF TAIWAN, LTD.

Established 1899

President : JIRO YASUDA, Esq.

Vice-President : TSUTOMU YOSHIDA, Esq.

Directors :

MASAJIRO ARAKI, Esq.

SEIZO KONDO, Esq.

KENJI YAMAMOTO, Esq.

Head Office : Taipeh

Tokyo Branch :

No. 2, 1-chome Marunouchi, Kojimachi-Ku.

Z. YAMAMOTO, Esq., *Manager*

Branches and Agencies :

Japan : Kobe, Osaka, Tokyo, Yokohama, Giran, Heito, Kagi, Karenko, Kee-lung, Makong, Nanto, Shinchiku, Shoka, Taichu, Tainan, Taito, Takao, Tamsui, Toen.

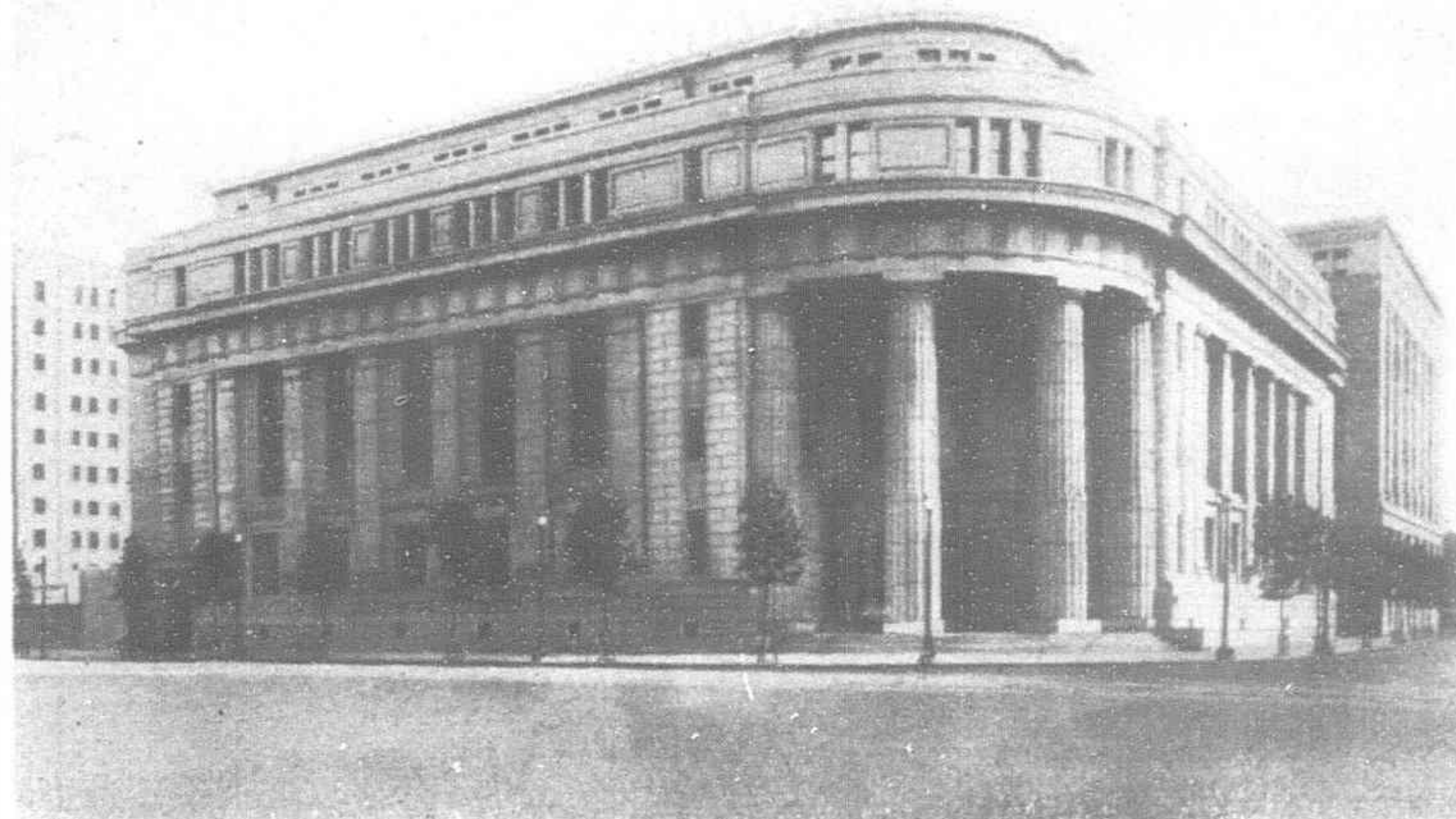
Kwantung: Dairen.

China : Amoy, Canton, Foochow, Hankow, Shanghai, Swatow.

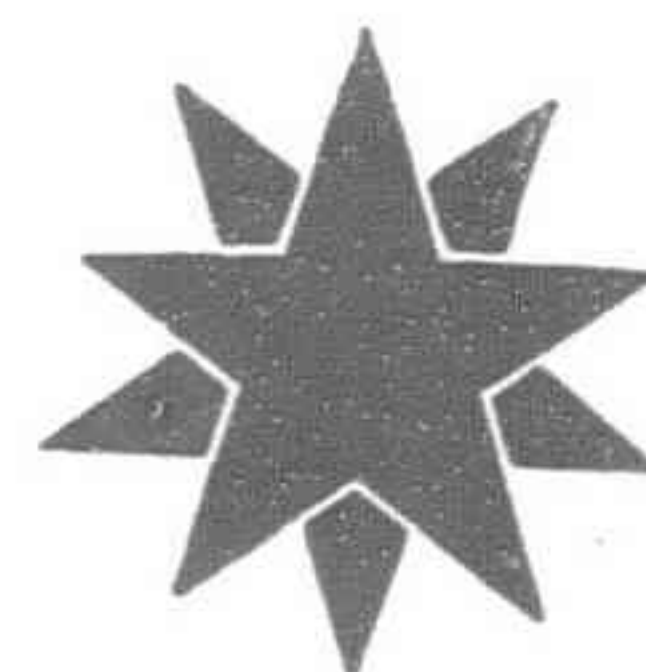
Java : Batavia, Semarang, Sourabaya.

Others : Bombay, Hongkong, London, New York, Singapore.

Correspondents in the principal cities and towns throughout the world.



The Dai-Ichi Ginko, Ltd., Tokyo



THE DAI-ICHI GINKO, LTD.

(FORMERLY THE FIRST NATIONAL BANK)

ESTABLISHED 1873

Capital (Paid up) Yen 57,500,000.00
Reserve Fund Yen 57,500,000.00
Special Reserve Fund . . . Yen 10,000,000.00

Board of Directors

TERUO KASHI, Esq.	Chairman
SAKAYE SUGITA, Esq.	Managing Director
VISCOUNT KEIZO SHIBUSAWA	Managing Director
JIRO TANAKA, Esq.	Managing Director
TOMONOSUKE KANOH, Esq.	Director
TOHTARO ONOYE, Esq.	Director
SHUJIRO SASAKI, Esq.	Director
SHOZO KODAIRA, Esq.	Director

HEAD OFFICE:

No. 1, 1-chome, Marunouchi,
KOJIMACHI-KU, Tokyo.
S. KODAIRA, *Manager*.

CITY BRANCHES:

Akasaka, Asakusa, Azabu, Fukagawa, Ginza, Gofukubashi, Hibiya, Hongo, Honjo, Horidome, Kabutocho, Kanda, Komagata, Kyobashi, Marunouchi, Mita, Muromachi, Osaki, Sanya, Shibuya, Shinjuku, Ushigome.

HOME BRANCHES:

Ashikaga, Fukuoka, Fushimi (Kyoto), Gojo (Kyoto), Hakodate, Hiroshima, Honmachi (Osaka), Hyogo (Kobe), Dojima (Osaka), Kiryu, Kobe, Kokura, Kumamoto, Kurume, Kyomachi (Kobe), Kyoto, Marutamachi (Kyoto), Senba (Osaka), Moji, Nagoya, Nishijin (Kyoto), Nishiku (Osaka), Osaka, Otaru, Sapporo, Shimonoseki, Shinsaibashi (Osaka), Osu (Nagoya), Tatebayashi, Toehigi, Toyohashi, Utsunomiya, Yokkaichi, Yokohama.

BRANCHES IN KOREA:

FUSAN, SEOUL.

LONDON & NEW YORK AGENTS:

London : Westminster Bank, Ltd., Midland Bank, Ltd., The Yokohama Specie Bank, Ltd.

New York : The National City Bank of New York, The Guaranty Trust Co. of New York, The Yokohama Specie Bank, Ltd.

CORRESPONDENTS:

The Bank, in addition to its own branches, has numerous Agencies or Correspondents in the principal Cities and Towns at Home and Abroad.



THE YASUDA BANK, LTD.

Head Office: EIRAKU BUILDING, TOKYO

CAPITAL SUBSCRIBED Yen 150,000,000

Chairman of the Board:

ZENJIRO YASUDA, Esq.

Deputy Chairman:

HIROZO MORI, Esq.

Managing Directors:

HISOMU SONOBE, Esq. TEIZABURO TAKEUCHI, Esq. YUZO HAMADA, Esq.

The Bank is now in command, not only of 35 Branches in Japan, but also of the services which it has secured from many correspondents throughout the world, and is able to offer accommodation for every kind of banking facilities, foreign and domestic.

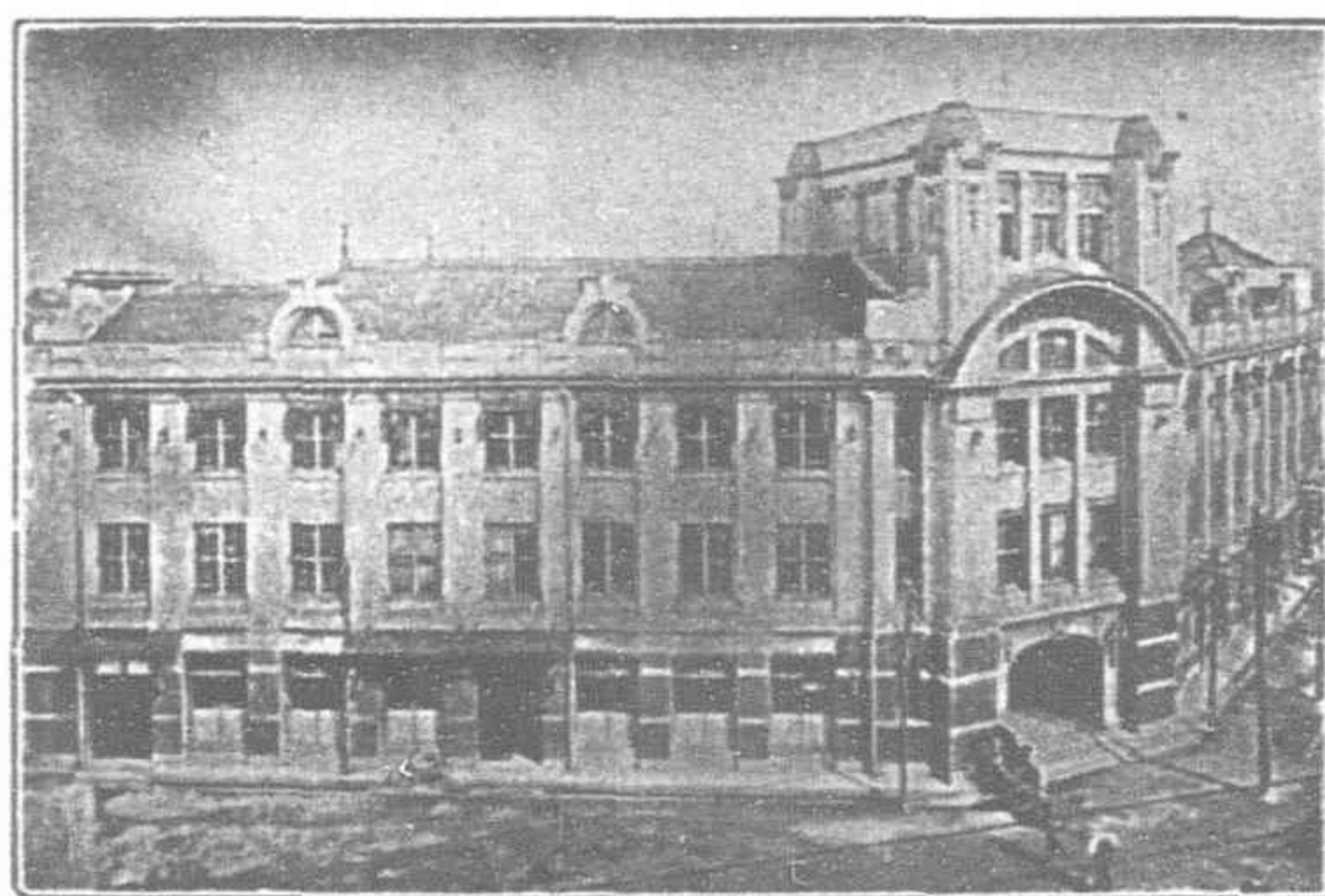
Foreign Business:

TOKYO HEAD OFFICE

YOKOHAMA OFFICE, Honcho

OSAKA OFFICE, Koraibashi

KOBE OFFICE, Sakaemachidori



General Office Building of Ujigawa Electric Power
Co., Ltd., Osaka, Japan.

UJIGAWA ELECTRIC POWER CO., LTD.

OSAKA, JAPAN

Authorized Capital Yen 75,000,000.00

YASUHIGE HAYASHI, *President and Director*

SENZABURO KAGEYAMA, *Managing Director*

17	Power houses (erected) with a total capacity of.. .. .	211,700 kw.
4	Power houses (under construction) with a total capacity of	31,600 kw.
9	Power houses (permit obtained) with a total capacity of	83,400 kw.
15	Power houses (permit applied) with a total capacity of	36,200 kw.
	<hr/>	
	Grand Total	262,900 kw.
	Power supplied	267,021 h.p.
	Its Customers	14,568
	Electric Lights	319,186
	Its Customers	146,040
	<hr/>	
	Purchased Power	100,100 kw.



SOUTH MANCHURIA RAILWAY

Head Office : DAIREN

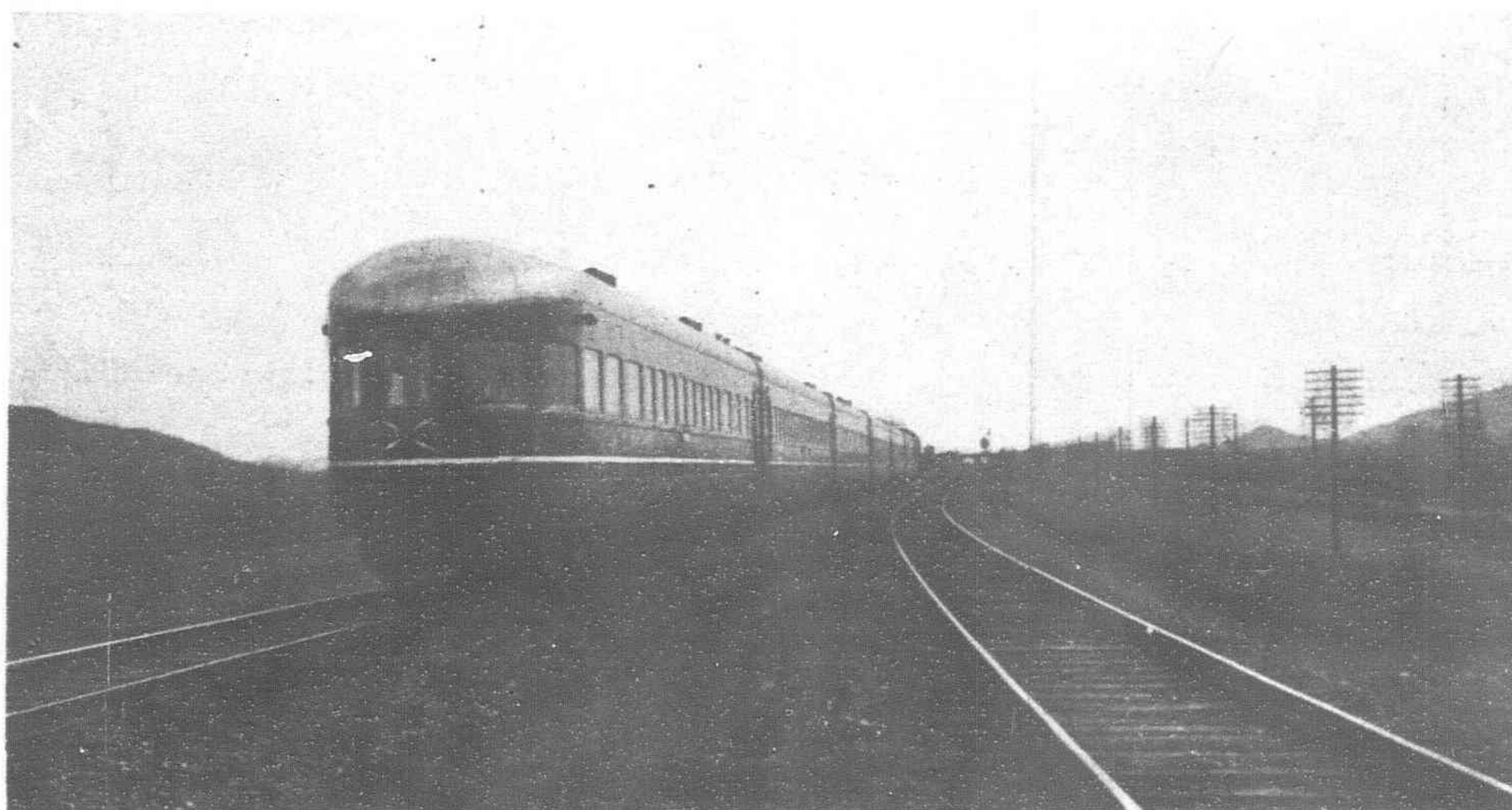
Cable Address : " MANTETSU "

Codes : ABC 5th Ed., A1,
Lieber's & Bentley's

IMPORTANT OVERLAND LINK BETWEEN EUROPE AND THE FAR EAST

From BERLIN to DAIREN in only 11 DAYS

The fastest and most comfortable trains in the Far East carry you to the much-talked-of Cross-Road of East Asia "Manchoukuo."



S.M.R. Super-Express "Asia"

YAMATO HOTELS

at Dairen, Hoshigaura (Star Beach), Ryojun (Port Arthur), Mukden, and Hsinking are directly managed by the South Manchuria Railway Co.

TICKET AGENTS

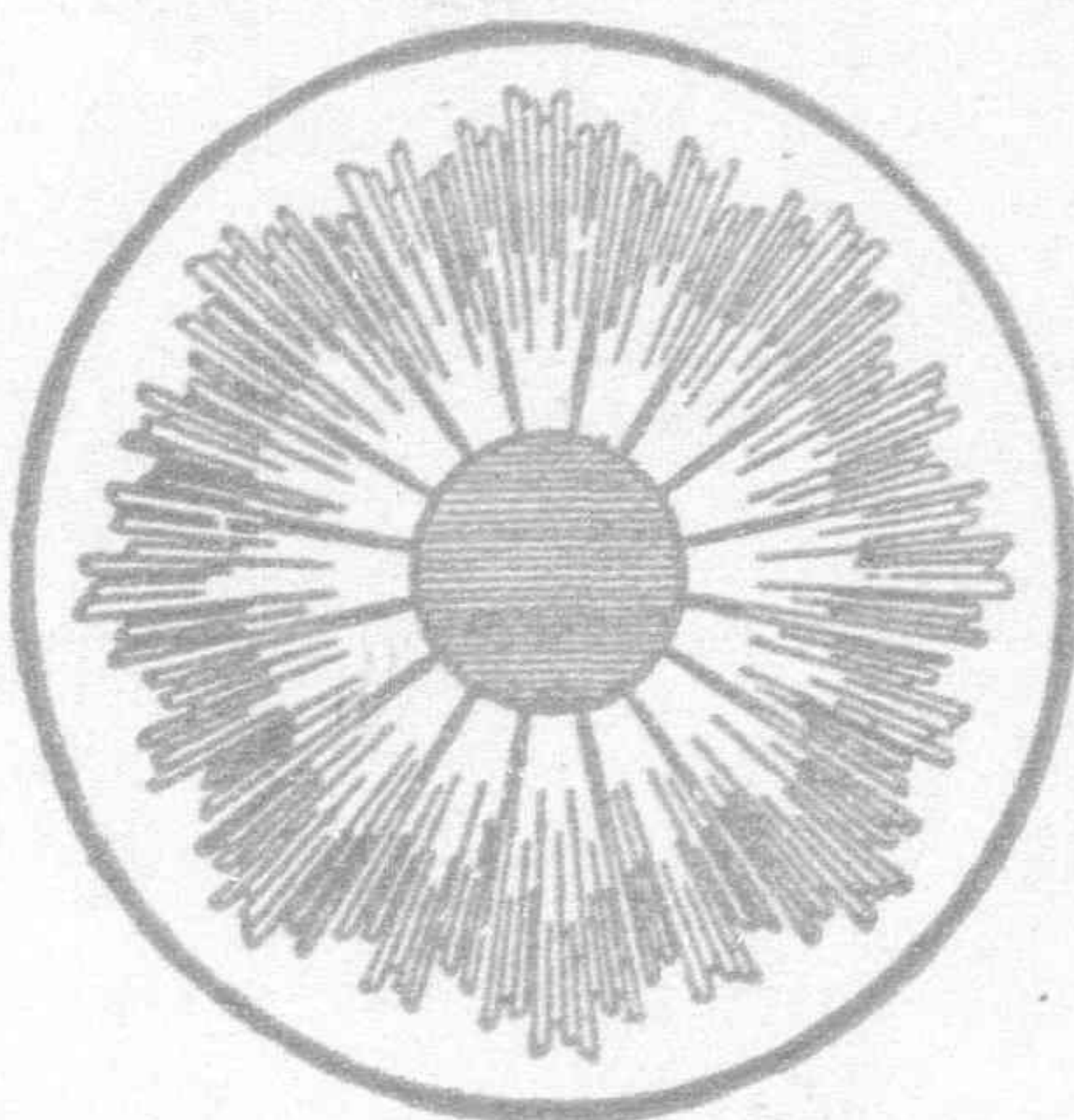
Tickets are issued by, and Pictorial Guide Books and Information may be obtained, at the following offices:

Messrs. The Japan Tourist Bureau; Thos. Cook and Son; The American Express Company; The International Sleeping Car Company ("Wagonlits"); The Nordisk Resebureau.

S.M.R. Branch Offices { Tokyo, Osaka, Shimonoseki, Shanghai, Peiping, Mukden, Hsinking,
Kirin, Harbin, Paris, New York, etc.

Capital (Fully Paid-up):
Yen 100,000,000

Reserve Fund:
Yen 130,900,000



CORRESPONDENTS
AT ALL
THE CHIEF
COMMERCIAL CITIES
IN THE WORLD

The Yokohama Specie Bank, Ltd.

Established 1880

DIRECTORS:

President: TOSHIKATA OKUBO
Vice-President: YAKICHI SUITSU
BARON KOYATA IWASAKI
BARON ICHIZAEMON MORIMURA
REITARO ICHINOMIYA
KENJI KODAMA

KIMPEI TAKEUCHI
KUNIZO MOGAMI
HIDESHIGE KASHIWAGI
KANJI YANO
NORI WATANABE

Head Office: YOKOHAMA

Manager: C. ARIMA

TOKYO BRANCH

No. 6, 1-Chome, Honkokucho,
Nihonbashi-ku

Manager: D. NOHARA

Marunouchi Agency

No. 2, 1-Chome, Marunouchi, Kojimachi-ku.

Agent: D. Nohara

SHANGHAI BRANCH

No. 24 The Bund
Manager: K. YABUKI

BRANCHES AND AGENCIES:

Alexandria
Bangkok
Batavia
Berlin
Bombay
Calcutta
Canton
Dairen
Fengtien

Hamburg
Hankow
Harbin
Hongkong
Honolulu
Hsinking
Karachi
Kobe
London

Los Angeles
Manila
Mojl
Nagasaki
Nagoya
New York
Osaka
Otaru

Paris
Peiping
Rangoon
Rio de Janeiro
San Francisco
Seattle
Samarang

Shanghai
Singapore
Sourabaya
Sydney
Tientsin
Tsingtao
Yingkow

CORRESPONDENTS AT ALL THE CHIEF COMMERCIAL CITIES OF THE WORLD

Interest allowed on Current Accounts and Fixed Deposits on terms to be ascertained on application.
Every description of Banking business transacted.
For particulars, apply to the Managers.

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Simplicity, Tolerance Urged for Pacific Era

By ROY W. HOWARD, Editor, "The New York World-Telegram" and Former Chairman of the Scripps-Howard Newspapers in the United States in "The Osaka Mainichi"

AT the risk of making what at first may seem to be a trite statement of fact, I believe that a new and more soundly based era of Japan-American relations is dawning.

In both Japan and America, there has developed a recognition of the fact that the diplomats, statesmen and publicists of both countries have made serious mistakes in judgment. In both countries there have been serious misjudgments of the psychology of the other nation.

More and more people, both in Japan and in America, are coming to recognize that the methods employed by the statesmen on both sides of the Pacific during the 10 or 15 years after the World War have failed to meet the demands of rapidly changing world conditions.

Much as it may be regretted in some quarters, a realistic review of events compels the admission that the world evangelism of President Wilson in the interest of democracy has ended in failure.

The rainbow-like hopes of the Washington Treaties have faded. Not because they lacked idealism, but because they failed to take account of the nationalistic differences of human nature.

With the rapid speeding up of world communication, these differences may grow less with the years.

To-day justice, equity, and even honesty are not only pronounced differently in different nations. The words even carry different connotations among people of different political, cultural, and economic backgrounds.

That this is unfortunate and prejudicial to the development of an idealistic world, does not lessen the necessity for dealing realistically with the resulting situation.

However great our admiration for Woodrow Wilson's dream of a world peace based upon the famous "14 points," we now know that that dream was wrecked by the Treaty of Versailles.

New Age of Relationships

Events following the World War have brought us into a new age of international relationships. I am not sure that it is going to be a happy or an admirable age. I am not sure that it is going to mark any great advance in civilization or in world culture.

I am sure that it is to be an age in which astute nations will devote more time to introspection and self-criticism, and will seek less and less to play the rôle of their brother's keeper.

So far as America is concerned, there is no disposition to belittle the efforts of President Wilson or to be contemptuous of the efforts of the framers of the Washington Treaties. The belief still exists that the Washington disarmament conference and the treaties which grew out of it were a commendable attempt to promote world peace.

Regret is deep and genuine that other signators did not share our faith in their possibilities for good. But behind American idealism there is American practicality, and American adaptability.

The attempt was worthwhile. To the extent that it has failed, America will accept the verdict philosophically and readjust her plans accordingly. If peace is not to be insured by disarmament—if the world rejects the plan—America will readjust to meet new world conditions. And she will neither fret nor sulk because other great nations are unable to see eye to eye with her.

Candor compels the admission that post-war diplomatic efforts, however honest and sincere and however benign, appear to have resulted in more and more international frictions.

This unfortunate development seems to have, to some extent at least, resulted from the deplorable cluttering of the international scene with a cumbersome network of overlapping international engagements and agreements. These, unfortunately, have failed to meet the unforeseen events which followed.



Roy W. Howard

A new approach to some of the problems at hand must now be made. It must be made in a fashion to take advantage of past mistakes.

Broad objectives must be sought, rather than petty advantages. Practical and workable agreements must be the aim of diplomats, rather than the negotiation of smart deals or hard bargains. Tolerance and reciprocal advantage must be the cohesive element in any such simple agreements, rather than force or duress.

Basic to all new international understandings must be recognition by the major nations of the world that this is the era of political experimentation. People of major nations must reconcile themselves to the political tastes and acceptances by other nationals of diverse political formulæ—fascism, communism, naziism, and democracy.

There must be tolerance and further recognition of the fact that a political system, repugnant to and unsuited to the temperament and character of one people, may be entirely suited to and most acceptable to people of a different nationality or race.

Americans with greater appreciation of and greater faith in their own democratic form of government, now realize that Wilson's idealistic attempt to "make the world safe for democracy"—was a colossal and costly error.

Americans Called Busybodies

It has branded Americans as a nation of political evangelists and busybodies, when, as a matter of fact, it is doubtful if the people of any nation on earth are more content to attend strictly to their own business and permit other people to do likewise without advice or suggestions from us.

Americans find that democracy suits us well. We have prospered under it, and are, we believe, continuing to develop and improve it for our own use. But we have definitely abandoned any desire to export it, and are quite content to confine its advantages to territory under our own flag.

It is my own belief that any successful new approach to international relationships must be based upon the realization that any nation, in the course of political experimentation of its own, resents any suggestion of internal interference by any other nation or any group of nations. There must be acceptance of the right of any nation to complete freedom to experiment politically as long as experimentation does not encroach upon any other nations.

To most Americans the theories of communism, fascism, and military dictatorships are repugnant, yet they are able to view the development of these conflicting theories of government with complete equanimity and even disinterest, so long as their development takes place on foreign soil.

It came to many Americans as something of a shock suddenly to discover that democracy, as it developed in Germany at the close of the war, did not function at all after the fashion of democracy in those nations where it had evolved gradually.

Gradually the realization has come to Americans that democracy must be preceded by a national state of mind. There has come recognition of the fact that democracy makes demands as certainly as it confers privilege.

More recently, Spain has furnished further evidence that democracy cannot be put on or taken off like a hat. It has also demonstrated that a people's likes and dislikes in government are as varied as a nation's taste in food and clothes.

Absurd as it seems in retrospect, it is a fact that a post-war reaction from the Versailles treaty was a disposition on the part of all the major powers to meddle more or less in each other's business. Both America and Japan were victims of the mood of the hour.

Happily the pendulum is to-day swinging in the opposite direction. While the tendency has not been completely eliminated, the present inclination of most of the world's statesmen—the most effective, if not the most vocal ones—is to concentrate on their own immediate and internal problems. With this development has come a greater tolerance for foreign political systems, so long as these systems are kept within their home frontiers.

As a further reaction from the theories on which the League of Nations was based, I believe that among most major nations there exists a deep-seated aversion to, and fear of, too many entangling treaty commitments.

Nationalism Burning Passion

So long as nationalism is a burning passion in so many quarters of the world as it is to-day (and this, too, is a phenomenon of the moment which will not long endure because it is reactionary and in a modern world is economically unsound), internationalism is under suspicion and of less force than at any time in recent years.

While this condition obtains, complicated treaties and agreements, multi-partied and involved, will be difficult to negotiate and more difficult to enforce. The new approach to peace and security must be through the medium of simple agreements broad in their concepts, limited in their exactions, easy of interpretation, and easy to support.

Particularly is this true in the case of Japan and the United States. Our traditions, our psychology, and our national needs and aspirations are widely divergent.

Putting aside all pretence and diplomatic finesse, the strongest tie that binds us is our economic interest in each other and our economic interdependence. The ties that bind us are not spiritual or cultural kinship. We are bound together by yen and dollars.

In this materialistic world such ties are apt to prove more substantial than those of a more sentimental nature. Once our trade relations are freed from political entanglements and permitted to take their normal and national course, they may prove more potent than years of diplomatic manoeuvring.

I myself do not believe that there has ever been any fundamental difference between Japan and America that, freed from political heat, has not been easy of amicable solution. Incidents and small frictions will occur from time to time.

But fundamentally, Japan and America are both commercial nations, each needing the other, and once our relationship is reduced to a simple and popularly understandable formula, that tie between the two is strong enough to stand any strain likely to appear on the diplomatic horizon.

You ask my opinion of the suggested neutralization of the Philippines.

It is my opinion that any such talk is decidedly premature. The American flag is still flying in the Philippines where it has flown for 37 years.

Under the law recently passed by the American Congress, a program has been set up and endorsed by the Philippine Commonwealth whereunder, beginning four years hence and continuing for five years thereafter, American control of the islands gradually will be withdrawn.

That program was worked out in fulfilment of a promise made to the Filipino people by the American Congress more than 35 years ago.

If the program continues to meet with Philippine approval, it will be carried out to the letter. But there are plenty of indications that the Filipinos may ask for a reconsideration. If they do, it will be because of their fear of what would result under any so-called neutralization of the islands.

It would be disingenuous for Japan to fail to recognize that what has happened in Manchoukuo is having its effect on Filipino reasoning.

Without discussing either the merits or the justification for Japan's course in Manchuria following the incident of September, 1931, the fact remains that developments on the Asiatic mainland, and later in Abyssinia, have raised grave doubts in the minds of many Filipino leaders as to the efficacy of collective security or existence under any neutralization plan yet devised by modern statesmanship.

Will Not Alter Plans

However, of one thing there is a certainty. No attempt will be made by America to alter the planned development of Philippine independence.

Furthermore, so general is American interest in avoidance of foreign entanglements that nothing short of a practically unanimous demand by the Philippine Commonwealth for a reconsideration of the independence program will even interest the American public in altering the course on which the Philippines are now headed toward complete independence.

In the meantime, it seems to me that if there is to be any consideration of neutralizing the islands, the proper point of origin for such a suggestion is with the Filipinos themselves.

As to the German-Japanese anti-communist agreement, my own thought, and I think the opinion of all Americans familiar with Far Eastern conditions, is that this is solely the concern of Germany and Japan, and that it is not a matter on which Americans are justified in voicing either opinions or advice.

Regarding America's attitude in event of a military clash between Japan and Russia, you may be very certain that the American people will demand that our country pursue a hands-off policy.

That such a course may be easier to maintain, I am certain that the forthcoming session of Congress will enact neutrality legislation, going much farther than anything we have yet attempted in the way of enforced neutrality.

The new legislation will be so drawn as to enable the Washington government to deal drastically with any commercial or financial interests whose course might be such as to involve this nation with either side in any future foreign war.

As to the situation *vis-à-vis* Japan and China, I can only say, speaking from a journalist's and not an official point of view, that I am certain that all that I have said before relative to the American citizen's determination to pursue a policy of stay-at-home-and-attend-to-our-own-business, governs in the case of the Asiatic mainland.

This does not mean that Americans lack sympathy for the Chinese in their effort to preserve their own territorial integrity. However, Americans long ago decided that until the Chinese could unite in their own interests and demonstrate their ability to present a unified and solid front, they were hardly subjects for worry.

However, the fact that the Chinese have recently evidenced a greater degree of national unity than ever before in their history, is being noted with interest in America.

Many People Are Hopeful

Many people entertaining feelings of genuine friendliness for both Japanese and Chinese, are hopeful that this political metamorphosis which has taken place in China, may actually work for a better situation.

They feel that it has been the political disorganization within China that has been provocative of many of Japan's moves which have been characterized as acts of aggression by the Western World.

They believe, correctly or otherwise, that if Chiang Kai-shek can continue to strengthen his position so that Japan can have a more responsible Chinese government with which to deal, better situations may result.

It is my personal belief, based upon what I saw in China in November, 1936, that the changed order there is going to call for a different approach by Japan. I believe that China is fast developing a nationalism of her own, for which she is prepared to demand, and for which in time she may earn, the respect of all the major powers.

Cynics and skeptics to the contrary, I believe there are many forces in Japan which would welcome such a development, and which would much prefer to deal with a strong Chinese government than with a weak one.

Under such a situation it is possible to visualize a new order. With Japan concentrating her Asiatic mainland activities in Manchoukuo, and with a political rapprochement between Tokyo and Nanking effected, economic readjustments advantageous to both countries would naturally follow.

Meantime, please do not think that I assume to be an expert in Far Eastern affairs. I have answered inquiries with complete candor; but speaking only as one who is interested from the viewpoint of a journalist, and as one who presumes to many valued friendships in both Japan and China.

In conclusion, and again speaking only as a journalist anxious to promote Japanese-American accord and friendship whenever and wherever possible, I would like to repeat that I believe that in the new era which I foresee developing in trans-Pacific relationships, simplicity and tolerance should be the essence of every Japanese-American agreement.

Thomas Jefferson, whom most Americans accept as the Father of the American Democracy, held that the country is best governed which is least governed.

It is my personal belief that at least during this era of intense nationalism in which we find ourselves, the world may be best managed by being least managed—through the instrumentality of old-fashioned trouble-breeding treaties.

The New China

By GEORGE C. SCOTT, President, United States Steel Products Company

(The following is the text of an address delivered at the session of the American-Chinese Trade Council of the National Foreign Trade Convention, held in Chicago in November).

IT is refreshing to observe the decidedly constructive movements that are at work laying the foundation for a New China in the economic world. We have been used to thinking of China as a territory of disintegrated provinces, ruled by a group of military tuchuns or war-lords who perpetuated their power by purchasing the support of leading militarists in the provinces by bribery, and who, nursing their aspirations for wider power, were in constant strife and competition among themselves.

The China we have known has been built around the family as the unit of population, with the parents teaching their children the art of earning a living, not deeming it essential to send them to school unless they were designed to follow some of the arts or professions in the higher walks of life. Thus illiteracy prevailed amongst the masses of the nation, and as a result of this family cohesion, often the inhabitants of whole villages belonged to a single clan. The interest in the family precluded much thought of public affairs. Consequently there was general indifference to politics and a lack of any national consciousness or patriotism.

But, in recent years, China has been undergoing an intellectual renaissance and its people have been growing receptive to modernizing influences. The seed sown by contacts with scientific thought and learning of the West has grown into an amazing awakening of the Chinese people to a new national outlook and consciousness that is unifying the country against its own internal weaknesses.

A comparison of some of China's similarities and contrasts with the United States will, to some extent, reflect the problems and development possibilities that have struck home in the Chinese mind.

(1) With an area of nearly a third more than that of the United States and a population of more than three times that of the United States, the masses of the people are chiefly concerned with eking out a sheer existence, representing a distressingly low purchasing power.

(2) Agriculturally, both countries are potentially self-sufficient, each having a great central river valley abounding in agricultural fertility; but farming in China is characterized by small holdings, primitive methods and crude implements.

(3) Both are countries of rich mineral resources; but there has never been any systematic investigation of the extent of China's natural wealth, and with no such fundamental knowledge available, it is difficult to promote industrial development with any confidence.

(4) Both have large industrious man-power of a high degree of natural intelligence, but it is estimated that the aggregate production capacity of the people of the United States is probably eight times that of China, though its population is only one-third that of China.

(5) The basic problems of internal communication and economic organization of both nations are quite similar, but because of China's lack of transportation and communication facilities, about 6/7ths of its population is congested in a third of its area, and trade for the most part is confined to small shops under individual or family auspices.

With such fundamental weaknesses as illiteracy and lack of territorial unity looming as definite obstacles to national development, the Central Government, which came into power and established the Chinese Republic after the revolution of 1911, set itself the task of promulgating a policy designed to strengthen the country's economic foundations. Dr. Sun Yat-sen was the leader of the Kuomintang or Chinese Nationalist Party since its beginning as early as 1895, when as "China's Re-creation Association" it aimed to drive out the Manchus, reorganize China and create a united government. Through various stages of reorganization and expansion of party objectives, Dr. Sun proved himself both a political leader and a true statesman of a high order. He was not only proclaimed "the father of the Chinese Republic"; but was the originator of the program for the Reconstruction of the Republic of China. To-day a picture of Dr. Sun hangs with the national flag in the assembly room of every public building, where all the employees gather every Monday morning to repeat his political will and do reverence to the father and great benefactor of the Chinese Republic, while pilgrimages to the beautiful memorial to him are frequent. Because of continued political difficulties and rebellions, however, it was not until after establishment of the Nationalist Government, in 1927, that the program for reconstruction began to achieve marked results. In 1931, by a People's National Convention called by the Nanking Government, a Provisional Constitution was adopted, which, in addition to rearranging the executive departments, not only established legal rights of the Chinese, declaring them all equal, and guaranteed free speech and free press, but pledged the Government to free education, agricultural and mining progress, elimination of overlapping of taxation and transit duties, and many reforms looking to social adjustments and security. To facilitate the study and execution of such a program, the National Economic Council was established and, at the request of the Nanking Government, the League of Nations appointed and stationed in China a special committee of 12 technical experts to collaborate with the Council in its work.

The problem of educating and encouraging the masses to get themselves out of their mental indifference is paramount, and the outstanding contributor to this cause is James Y. C. Yen (commonly known as Jimmy Yen), who, while doing welfare work in a Chinese Labor battalion in the World War, selected some 1,300 Chinese characters that occurred most frequently in the vernacular and made four cheap text books. In 1925, he founded the National Association for the Advancement of Mass Education and in co-operation with the Nationalist Government and a corps of teachers, millions of laborers and farmers have been taught to read and write and have received the degree of "literate citizen." Yen is still active as Director of the Mass Education Experimental Station at Tingsien, Hopei, in an effort to make literate many more millions of Chinese between the ages of 16 and 20. In addition, the Government last year proclaimed a five-year plan of compulsory education for children of school age, and the Minister of Education is now recommending that the period of compulsory education, which began with a modest six months, be extended to eight years. Scholars now in attendance in elementary schools number 11½ millions and those in high schools, 500,000; compared with 2½ millions and 52,000, respectively in 1912, when the Republic was established. The number of Chinese students in foreign schools and colleges is greater than ever before, those in the United States, assisted to a considerable extent by the Boxer Indemnity Fund, outnumbering any other nationality.

The substantial advance made in the country's political consolidation is of significant importance. Five years ago the Central Government controlled only five provinces, but under the rapid spread of the Nationalistic movement throughout the length and breadth of the country, in which a strong spirit of "China for the Chinese" prevails, more than a dozen of the eighteen provinces have come under its effective administration. A striking example of this influence was witnessed this past summer when two of the provinces in the South-west of China almost started a rebellion by urging the Government to declare war against Japan. This crisis was averted because the aviators who flew the best bombing planes and all the important generals refused to fight and, with other leaders, flew back to Nanking and surrendered. Thus the Nanking Government gained control of two new provinces without a fight and without bloodshed. By contrast, a very cosmopolitan example of this new national consciousness is the advent of songs resembling American songs. For centuries the Chinese have had cheerful work

chanteys; but now songs of a different spirit, infusing the people with a new sense of their national power and destiny, are becoming popular.

Agriculturally, there are millions of acres of fertile lands in China awaiting economic development, which are capable of producing not only ample food for China's present population; but also a surplus for export. On the part of the Government, the National Economic Council is at work on problems of scientific agriculture, well planned irrigation, extensive afforestation, essential means of transportation and improvements in rural credits and marketing methods, while throughout the provinces the rural co-operative movement is rapidly becoming a strong force, there now being 38,000 co-operatives in China, an increase of 12,000 within a year, with membership doubling in that time. Although there has been as yet no marked increase in the total crop production, prices received for farm products during the last year were appreciably higher and production costs tended to reduce, both to the benefit of the small farmer.

Lack of essential facts and reliable statistical data, were controlling obstacles to the formulation of any concrete projects in the way of China's industrialization. The Minister of Industry has, therefore, undertaken the preparation of a series of "China Industrial Handbooks" embodying investigations and detailed surveys of China's resources, transportation facilities, market conditions and other relevant matters. Because of the extent of the territory and the loosely-knit organization of the present national economy, the work is being handled by specific areas. The Yangtze Valley has been chosen as the national center for heavy industries, which will serve as a general foundation for the gradual industrialization of the whole nation. The hesitancy of private capital to engage in public utilities and industrial enterprises has resulted for the most part in the development of State controlled and operated industries. Reflecting the growth of confidence, however, there has been in the last year a gradual but continuous expansion of private capital investment in industrial undertakings, while attesting the transition from handicraft and cottage industries to mechanized industry is the fact that there are to-day more cities under construction in China than ever before.

Transportation is, of course, a major factor in China's economic development. Although there are at present less than 10,000 miles of completed railways, preparations have been made for very extensive expansion of the country's railway mileage. This new construction has attracted strong interest of European capital. Modern highway construction is proceeding even more rapidly, with 50,000 miles now open to traffic, and motor vehicle transportation developing accordingly. Moreover, though China's interest in air transportation is barely a decade old, it already has almost as many miles of regular air service lines as railways, in the development of which America has had so important a part. With these new means of transportation it is possible for a parcel to reach in a week or even days some destinations which used to take as much as a year, and radio sets and moving pictures bringing contacts with foreign lands are now found in towns which were once entirely cut off from the outer world.

Paralleling the strides made by way of transportation, the development of telephone, telegraph and wireless services have gone far toward assisting China's transition. America has, likewise, taken a large part in this business. It is surprising to note that there are more radio stations in Shanghai than in any other city in the world, regardless of size, as in view of such vast distances China is directing considerable attention to radio for commercial purposes because it makes possible rapid communication at low cost with equipment which may be quickly installed.

Concurrently, China's whole financial structure is being revolutionized. Dr. T. V. Soong, now Chairman of the Bank of China, was the great reformer of the Government's finances. It was he who worked out China's tariff autonomy, the abolition of *likin*, and the removal of the various *taels* as units in Chinese currency, making the dollar the sole standard. It was he who modernized the various departments of taxation, and for the first time in modern Chinese history actually succeeded in balancing the Government's budget during the year 1933, without recourse to loans. Regardless of the causes of the drainage of silver from China during the past few years, the result was a severe internal deflation, which forced the Government to change from the silver standard to a managed currency and, on November 3, 1935, to promulgate certain regulations and financial measures for the reorganization of Chinese currency,

stabilization of exchange and reorganization of the Central Bank of China into a central reserve bank. The fact that the new policy resulted in general improvement in business and banking circles, and that both the price of silver on the world market and the Chinese dollar exchange have since remained steady, would seem to prove the soundness of the measures adopted.

Shanghai has the distinction of being the fourth largest port of all the seas; but its Western superiors are all ports which serve territories which have already reached the apex of their development. Shanghai is the natural gateway to a great hinterland that is just being opened by roads, airplanes, railways and modern enterprises, with its future and growth in front and not behind it. It was the momentum of all these movements that impressed Dr. Forbes and the members of the American Economic Mission to the Far East, when they reported that "a vast change is coming over China; a modernization that, as compared with ten or even five years ago, marks many centuries." It is to them, I feel, that we owe a great deal of our own awakening to what is actually taking place in China. Likewise missions from Great Britain and Germany have been impressed by China's new growth and trade attractions.

That these movements are the forces of utmost concern in China's life to-day is evidenced by the character of commercial reports currently received. Taking the cable of October 9, from Commercial Attaché Julean Arnold at Shanghai, we read such items as:

"Internal administrative conditions made favorable progress during September in the achievement of national unity. * * * * Among the economic measures advocated were lower exchange value of the yuan for encouragement of exports; higher domestic prices to be realized through the control of agriculture and industry, tending to raise the standard of living. * * * * Leading economists recommended increased participation by domestic capital in industrial plants at interior ports rather than concentration at Shanghai. * * * * Plans are going forward for the construction of new railway lines in the south, central and north central portions of the country. * * * * Practically every Province in China is also now developing a highway program in co-operation with the National Economic Council, and is endeavoring to do its part in co-ordinating highway construction into a national network. * * * * Shipping facilities on the Yangtze River have been augmented in order to handle the large movement of agricultural products down river. * * * * Bank loans on agricultural products have increased. * * * * Shanghai reports better economic conditions of the farming masses. * * * * Sales of electric power for industrial use throughout Shanghai are increasing. * * * * Real Estate improvements indicate a better business outlook."

From what other nation do we get such reports of basically constructive activity?

China having thus determined to develop, with the gradual unfolding of her program of reconstruction, her needs for foreign

products and manufactures will multiply and her foreign trade will grow. But China lacks adequate capital and she needs help—financial help. The question of how to assist her, however, is a problem when her credit in this country is in such an unfavorable position. We are informed, however, that recent loans have been fairly well met and that Chinese Government officials have a genuine desire to consider past indebtedness. Of course, European nations have assisted directly by use of the Boxer Indemnity Funds, by which Great Britain as well as Italy have aided in the construction of railroads. Recent reports indicate that the Netherlands Boxer Fund is being used for a modern sewage and drainage system; and only a few weeks ago it was reported that England would extend a substantial credit to China. Germany, France and Belgium have all supplied credit, or are working with China on proposed projects. China needs help to raise the country to a basis where the standard of living will compare, say, with that found as the lowest standard in Europe to-day, with the hope it will improve for, of course, modernization is as yet of a spotty nature and by no means general throughout the country. As a whole, China is not over-populated as is often assumed. With modern science and organization applied to agriculture, industry, trade and transportation, the present population could be so distributed as to raise economic levels of its masses very considerably.

American friendship has played a significant rôle in China's history and trade since 1784, when the *Empress of China* the first American ship [to engage in trade with China, our oldest world customer, arrived at Whampoa, now Canton. American products and wares have come to be favored along with American ideas and methods. Since the World War we have learned the value of thinking on an international basis. We have found that the more we can do to bring about a better understanding and improve the standards of living in another country, the greater will be the demand of that country for the things we produce, proving that, to be foreign trade minded, we must be internationally minded. America has been foremost in the pioneer work that has helped to awaken China to a consciousness of the possibilities of her own nation. The training and education of thousands of Chinese students in our schools and colleges, the unselfish American missionary and philanthropic enterprises in China, John Hay's declaration of the Open Door policy, respect for China's sovereignty and territorial integrity, by being the first nation to recognize the new Republic, a policy of justice and amity in all our dealings with China, have combined to inspire the faith and confidence of the Chinese people in the sincerity of America's purposes. The foundation of American trade with China has, therefore, been firmly entrenched. It is the commodities, methods and ideas to which the Chinese become accustomed in these impressionable years of the building of her new economic structure that will largely influence her future trade.

The Japanese Viewpoint

Recent Pacts Do Not Carry Nipponese Endorsement of Fascism

WHILE Japan has concluded agreements with two Fascist countries of Europe, this does not mean, in any way, that Japan approves fascism, Prince Fumimaro Konoe, President of the House of Peers, declares in an interesting and provocative article, which has recently been translated into English.

Some European powers, especially England and France, which are rather more afraid of fascism than communism, may believe that Japan has combined forces with fascism; but such a conception is erroneous. It cannot, however, writes Prince Konoe, be dismissed as merely misunderstanding, especially as it is reported that movements are afoot in England, France, and the Soviet Union, on the one hand, and England and the United States on the other, for the formation of anti-fascist blocs.

"Japan had made positive maneuvers to ally herself with England, and accordingly the Japan-German pact was not directed in any way against that country. Inasmuch as the Japan-German pact is aimed solely at the Comintern, the Japanese government ought to make utmost effort to remove misunderstanding among the foreign powers, states Prince Konoe."

Turning to another phase of Japan's foreign policy, Prince Konoe observes that the most difficult diplomatic question with which Japan is faced, is that of her relations with China. The Chinese Government, he declares, especially in view of the growing anti-Japanese sentiment throughout the country, is eager to make an alliance with the Soviet Union.

Incidents arising out of anti-Japanese sentiment aggravated Sino-Japanese relations, and have brought them to a critical point. It is imperative for the Japanese Government to unify public opinion and to follow a stable policy toward China, he adds.

Prince Konoe strikes out firmly against secret dealings with China. "Recently," he writes, "bureaucratic secret diplomatic dealings have been severely criticized. I do not see any need for the Foreign Office to make known the details of diplomatic negotiations before the agreements are reached, but the government should be fully backed by the people in conducting its diplomacy."

"The government should fully make known its diplomatic policy to the people, either through the press or the government gazette, so as to secure the public's support."

Commenting upon domestic affairs, the House of Peers leader states that the cost for national defence, amounting to 46 per cent of the general budget estimates, is called for by the present international situation.

In regard to political reforms, especially the revival of the strength of the party system, Prince Konoe makes the following observations:

"In considering this question, we must renew our conception of the intrinsic nature of the constitutional government of this country.

"In this, we must not forget the special relations between the Imperial Family and the subjects which have existed for the past 26 centuries. All conclusions must be derived therefrom.

"We must not discuss questions of parliamentary politics and government in the light of the British constitution.

"For instance, our cabinet ministers are duty bound to assist the Ruler in the administration, and they can on no account refuse to give their signatures to any Imperial Decrees. In this respect our constitution differs entirely from the British constitution, and accordingly our constitutional government differs from that of England.

"This important point must be borne in mind, in discussing the constitutional government of this country.

"While admitting the rational quality of party politics in contemporary politics, I cannot admit party government is the best political system of this country. The characteristic constitutional government of this country may not necessarily be maintained by political parties.

"Accordingly, both the arguments that a government should be formed by political parties and that a government should not be formed by political parties should be defied. If political parties attempt to regain power, taking advantage of an unsteady situation without a proper conception of the peculiar constitution of the country, they will be greatly mistaken.

"The military, political parties and the people at large, should thoroughly reconsider the important peculiarity of the constitution of the country, and eradicate the friction now existing in many circles and classes, and render efforts for the enhancement of the national destiny."

Prince Konoe also states that Japan must be prepared to face as many difficulties in 1937, as she met in 1936, particularly in the field of international politics.

* * *

A British Viewpoint

The full text of the German-Japanese Pact, now published, discloses nothing particularly earth-shaking, says *The London Morning Post*, and continuing, adds. Indeed, it contains even less than the little which anticipatory rumor (of unquestionably German origin) had led us to expect last week. It amounts to no more than a pledge of mutual assistance in combating the subversive activities of the Communist International; nor is it exclusive to the original signatories, for it unreservedly invites the adhesion of

any third parties who may feel themselves threatened. With its avowed aims an overwhelming majority of people outside the Soviet Union will cordially sympathize: nevertheless, with the possible exception of Italy, no important country, we imagine, is likely to signalize that sympathy by formally joining. There can be no doubt whatever but that the Pact represents the diplomatic first-fruits of the Holy War against Communism proclaimed by Herr Hitler at Nuremberg. It is equally clear that this Holy War has been declared with no other object than to further the national aspirations of Germany. Herr Hitler has not the remotest reason to fear any alleged Communist menace to the political integrity of his own country, whose secret police is quite capable of dealing with all and sundry by its own unaided efforts. Nor will anyone credit him with a mere disinterested philanthropy anxious only, for their own sakes, to save from perdition the political souls of others.

The so-called "war of ideas" is, in truth, being seriously over-done by its proponents. We cannot but recall that in its Seventeenth Century prototype, Cardinal Richelieu did not hesitate to support Protestants abroad when it suited the cause of France. Moreover, only a few days ago Mr. Eden declared with an emphasis which undoubtedly reflected the great mass of British public opinion, that Great Britain has no intention of being drawn into this allegedly ideological conflict. We may all of us detest Communism, but we are not for that reason going to be lured into a net that is spread primarily for the promotion of others' interests. The matter is, however, one which every country must judge for itself: those who, for reasons of their own, choose to follow the German lead are not thereby brought into any sort of implied opposition to those who do not. It is not for us to inquire what may have been the motives which actuated Japan into subscribing to the present Pact; suffice it only to record that a common German-Japanese front against the Comintern in no way impinges on any known national interest of ours. In fact, so far as such a front serves to arrest Communist penetration both in Europe and in Asia we, for our own part, can regard it with a benevolent tolerance.

In the meantime, it is unfortunate that the proposals for a friendly accommodation with this country, which were initiated by Japan some months ago, are still meeting with an unduly tardy response. It is true that there have been one or two "incidents," such as the smuggling in Northern China, which have caused minor diplomatic friction between Great Britain and Japan. But such incidents, which are always liable to occur under the clearest of international skies, should never be permitted to interfere with broad policy. Stopping the plough to catch a mouse is no wiser in diplomacy than in agriculture. When Japan wishes us to share in the commercial advantages of a politically and economically rehabilitated China, and when she is ready to offer us strategic security in the Far East, are we to turn away because of transient controversies in small matters? Those responsible for our foreign policy may do well to reflect that they have, in the last few years, secured few, if any, tangible successes to their credit, and have manoeuvred us into more than one false position. Can they afford to put themselves in the way of repenting yet another missed opportunity?

China and Engineering

By WILHELM THIEMANN, V.D.I., Former President of the Chinese Association of German Engineers at Shanghai

To one who has comprehended the influence of technics upon the development of Europe and has sensed the force of the soul of ancient China, it is not difficult to understand the peculiarities of the progress of engineering in the Middle Kingdom. There, Western civilization was smiled at when it first tried to establish itself and to apply a destroying hand to the order of Confucian institutions. Tenacious resistance faced the alien science which had created the means of serving the destroyers. For it was plainly the tools of Western engineering which lent success to the conquerors. Cannon-studded ships extorted assent to treaties. Contrary to the experience of former centuries, however, the foreign partners to these treaties were not absorbed by Chinese culture. Nay, with rail vehicles and steam locomotives, they invaded the great country. What to them was upbuilding meant destruction in the sight of the Chinese masses.

There was, indeed, an occasional Chinese who felt an understanding for the new. But these were few and far between, and their appeals found no response. There was also some true goodwill for the reform of Chinese methods, which, however, came into conflict with the all-powerful government system and brought nothing but failure. There were numerous provincial governors who saw no material advance in the creation of railroads and telegraph lines, but merely things of fashion made purely for enjoyment. On the other hand, however, the desire for gain of the once low-esteemed merchant caste joined hands with the business sense of foreigners to develop engineering at a time when the industrial and traffic institutions of the imperial mandarins had for decades been struggling to prolong their lease of life.

The defeat of China in the war with Japan at the end of the last century and the foreign political reactions of the Boxer

rebellion around the beginning of the new century brought a final decision in favor of modern engineering and industry. The formation of the secret societies, from which sprang also the Kuo-mintang which is now in power; the revolution of 1911, which did away with the rule of the emperors; and, finally, the conquest of Central China and of the North by Chiang Kai-shek, who founded the new government of Nanking, were at the same time also milestones in the transition from ancient Chinese ideals to the methods of international engineering research and enterprise.

To be sure, old China also had an industrial and engineering tradition of its own in its trades, agriculture, waterways, and mining, and one which reaches back over three millennia. The variety of tools employed in the different trades, the technically correct methods of their use, the skilful application of human and animal muscular power at maximum efficiency, the invention of simple semi-mechanical contrivances unknown to Western civilization, the high development of junk construction, the ingenious methods of rapid carriage of loads, are some of the characteristics of the high development of technical ability. Manual arts, from pottery to silk weaving, show in their products the success with which Chinese have wrought for more than a thousand years. Artificial irrigation by means of water-wheels, bucket-wheels, and water-lifts operated by wind power or by human and animal power represent applications of mechanics of some greater pretence. World-renowned are the gigantic canal structures which were built in centuries of labor, the huge dams for controlling the high water of the rivers, and the great wall for protection against the barbarians. Notable achievements in mining are the salt pits in the province of Szechuen, which are drilled with simple means to depths of a thousand meters (3,300-ft.) and more, and in which the salt is won by solution in water. Natural gases have there been employed since antiquity for evaporating the salt lye.

A people capable of creating engineering works of this kind is, without question, fit to pass directly to the use of modern Western auxiliaries. Wherever manual skill is the decisive factor, the Chinese have, indeed, many peak achievements to their credit. Their machinists, fitters, and other practical workers are able, with the simplest means, to create appliances and to carry through tasks which a Westerner would not be able to handle without highly developed machinery and tool equipment.

China's technical development entered the stage of continuous growth only, however, after a new generation of engineers in private and State establishments had got hold of the initiative. This did not happen overnight, but in the ups and downs of political and economic change. Only a few purely Chinese establishments possessed of vitality were conducted on the Western model at the time of the proclamation of the republic, in 1911. The flourishing business period at the time of the World War brought to China the cotton industry, which is at present the one farthest advanced. At first confined to spinning mills, it was towards the end of the War increasingly expanded in the direction of mechanical weaving, and 1919 saw the first great mechanical dyeing works. To-day, several dozen mechanical dyeing plants are in competition with the indigo hand dyers, of whom thousands are still in the trade. But the work of the textile industry became ever more diversified. Chinese did not restrict themselves to the formerly customary thread sizes and simple fabrics. The land of the old silk weaving and dyeing processes found its own patterns for finished cotton fabrics, and without number are the methods whereby, with the aid of machines and modern chemicals and dyes, spun, woven, and other cotton products are to-day being manufactured in China. The jump to wool came at a relatively late moment, but is now also an established fact.

A different situation exists in the mechanical industries. Their introduction into a population accustomed for ages to working with iron and other metals offered no difficulties. The use of drills, lathes, and other simple machine tools began with the first machine import into China. But the further evolution of the various branches of the mechanical industries, which has culminated in the West in machine mass production paired with maximum precision, is still in its beginnings in China. Not even the arsenals, which were founded in the nineteenth century, have hitherto been pace-makers in this direction. It is only within recent years that a decided change is noticeable also in the mechanical industries.

China still lacks, however, the means for supplying itself with raw materials for these manufactures. Despite ample iron-ore deposits, the country does not yet possess metallurgical plants worthy of the name. Of nearly a dozen blast furnaces built in

China, none were in operation for years and only two smaller ones have been going lately. The old Han-Yeh-Ping steel works, which, in part, supplied China with rolled material before the World War, will not again revive. Possibly new plans will materialize.

Developing at a rate similar to that of the textile industry has been the progress of the food and dainties manufacture, as well as, lately, the establishment of a chemical industry, which has attained a position of some influence. Mention should, above all, be made of flour milling, although, after a brilliant start during the World War boom, it is now stagnating. Modern oil extraction, too, has hardly been able to hold its own against the ancient trade methods of the oil millers. Considerably better success, under foreign influence, has attended the development of beer brewing. A purely Chinese achievement, on the other hand, is the expansion of canned food manufacture. In conjunction with these industries and the large egg-product export, the refrigerating industry has been greatly developed.

Cigarette manufacture has largely expanded, particularly during the last ten years. Its advance has indirectly boosted printing, which is principally dependent upon the manufacture of folding boxes, cigarette advertisements, and the like. Newspaper and book printing are no longer on their former low level, qualitatively speaking. The Chinese, however, make no high demands upon printed products, but insist on the lowest possible cost, so that primitive methods are the ones by far in the most general use.

In chemical engineering, a certain modernization as regards soap manufacture and its allied fields is manifest. The production of paints, ink, shoe polish, simple medicines, glycerine, sulphuric acid and nitrogen, though all of them in relatively small volume, are achievements of the last few years. A high state of development, due to the building activity in the large cities, prevails in the cement industry.

Of more influence upon industrial modernization in China than all economic causes, however, has been the political revolution, which laid the foundation for the new China with the adoption of Nanking as the new seat of Government. The most direct effect of the political developments has, above all, been exercised upon traffic, upon the centralization of the supply of larger districts with electrical energy, and upon the supplying of the new army.

With the re-establishment of quiet, this development materialized in the Yangtze valley in a large river and canal traffic, and in parallel developments in all of the southern provinces. Above all, China has adopted the extensive use of the Diesel engine for ship propulsion. At the time when this river and canal shipping had just arrived at a certain point of saturation, a new development followed in the shape of the erection and enlargement of several overland power stations. While it cannot be said that this development has passed its apex, it is certain that its place is now being taken by a period in which an extraordinary enlivenment of land traffic is the most conspicuous feature. This is equally true of railways and automobile roads. Apace with them, the telegraph and telephone are increasingly gaining ground.

Although, therefore, considerable industrial and engineering progress has been made when judged by the standards of the country, the justifiable optimism would be turned to disappointment if one were to view things purely with the eyes of the Western engineer. The Chinese market—at present still the only market in the world without monetary and import restrictions—is overrun by the merchants of all countries. From the old Chinese habit of bidding down all import goods to the finish, even the most modern of Chinese factory managers are not, as a rule, to be diverted, with the result that the decision is but too often to the detriment of quality. The greatest impediment to all industrial development, however, is the absence of available investment capital at reasonable interest rates.

In its foreign orders, every Chinese industry is compelled to see to obtaining the best possible facilities in regard to payment from its machinery suppliers. As full of promise as the Chinese machinery import market appears for the future, as difficult is it to bridge the transition years of high expenditures and modest potential success in such shape as to enter well prepared into the more favorable coming years, which are as yet in the shadow of the political future. The principal influence upon all development, present as well as coming, lies with the Chinese engineer. The epoch when railroad administrations were manned with European and American engineers is long past, and the number of foreign engineers in Chinese enterprises is steadily declining. It is only in concerns of

non-Chinese nationality that foreign engineers continue to hold their own. The same is true of the large Japanese enterprises; which, at present, and just like the English undertakings, serve as models to the Chinese for their own creations.

Germans are at a great disadvantage by comparison with the Anglo-Saxon peoples, because English is the principal language in international commerce with Chinese business men. It is nevertheless remarkable to what extent the minority of German-speaking Chinese engineers have successfully come to the front with the authorities as well as in private plants. The Technical University (Tung-Chi University) at Woosung, in which German professors are teaching, is well renowned. Technical colleges with predominant English influence are, however, and rightly, recommended to the parents of pupils about to leave school, as particularly promising success; and inasmuch as almost all private and official intermediate schools prefer the English language, the choice of an English university is always the most natural. Added to this, is the fact that, until now, Chinese industrial and engineering concerns have not been able to absorb the large number of engineers which flow back from abroad and from the inland schools to seek employment in China.

That, hitherto, good success has been the lot of the German-trained engineers in China, is, above all, due to the cordial relations, based on equal rights, which link China and Germany. Additional factors in this success have been the products of German machine builders, backed by the entirely individual treatment of the Chinese market by the German sales engineers resident in China. The

principal cause, however, is, and remains, the knowledge and ability of the German trained Chinese engineers, who have shown that they are at the very least equal to their colleagues who return from England and America. The cultivation of the ties with these men is a matter of course for German industry.

Over and beyond this, however, the interest of the much larger number of English-speaking engineers wants to be kept alive and to be awakened where it does not yet exist. These engineers well know the achievements of German industry in fields subject to Chinese demand. To render these engineers more familiar with the fields which may become of importance for China at some future time, is an evident necessity. This is a fact which is understood on both sides, although much work and effort are needed to fill the gap resulting from the language difficulty.

A fact which is perhaps little realized is that Chinese representatives of the engineering sciences, who, though fluently speaking English, are hardly able to talk German, are yet in many cases completely versed in the German literature relating to their special fields and study these works at the expenditure of much trouble. To bring German science and engineering nearer to these men is a task particularly rich in promise. The Tung-Chi Technical University at Woosung is now placing increased emphasis on training its scholars in English, and also the Chinese Association of German Engineers has lately, by way of an exception, had an illustrated lecture held in English in order to acquaint English-speaking engineers in the textile industries with the results of German experience and engineering practice.

China Vegetable Oil Corporation

Of special interest is a project lately launched by officials of the Chinese Government to create a monopoly to handle the production and distribution of Tung Oil primarily and, in addition, the production and distribution of vegetable oils in general that are produced in China. In the following the details of the proposed enterprise are set forth.

* * *

It is generally understood that woodoil is one of the main necessities of industry and one of the principal products of China. The oil is produced in Szechuen, Hunan, Hupeh, Chekiang, Kwangsi, Anhwei and Kweichow. The annual production is about 1,600,000 piculs of 133½ lbs. each, of which over a million piculs are exported. During the recent slump in the exports of silk and tea, woodoil has taken first place in the list of China's exports. The benefit of this oil to the welfare of the nation and its people is beyond words.

In reviewing the export market of China's woodoil, the U.S.A. is the chief buyer, since she absorbs over 60 per cent of the quantity exported. From the present requirement of oils in the U.S.A., we learn that the value of the annual importation of linseed oil is estimated at about U.S. \$60,000,000, which is equal to the value of linseed oil produced by them, whilst the value of woodoil imported from China is about U.S. \$15,000,000. Inasmuch as the quality of woodoil is much superior to linseed, the market for the former in the U.S.A. would become much bigger if all linseed oil could be replaced by woodoil. In view of the recent encouragement given by the U.S. Government for the planting of tung trees (woodoil), it is estimated that after twelve years or so the U.S.A. will have about 200,000 acres (about 1,200,000 mow) of Tung forest and the supply of woodoil will be sufficient for their requirements. The area of tung forest she now possesses is about 370,000 mow (about 60,000 acres). For the extraction of oil, etc., new methods are being used and the quality of oil produced is very good. In a conference of tung oil merchants held the year before last in the City of Piedmont, U.S.A., Mr. C. C. Concannon, Chief Chemist for the American Board of Trade, said that the quality of Tung Oil (woodoil) produced in the U.S.A. is much superior to that imported from China. From this we have to admit that very big strides have been made in the U.S.A.

The British Empire, Germany and France also consume fair quantities of Chinese woodoil. They are also making strenuous

efforts to produce this oil. The British Empire is working the hardest. It is reported that Australia, New Zealand, India, Burma, Ceylon, Malaya, South Africa, Soudan, West Indies, Honduras and other places have secured very satisfactory results from the planting of tung trees.

Further, Russia has planted 900 acres of tung trees which are to be increased to 36,000 acres by 1937. Argentine and Paraguay have about 50,000 and 30,000 tung trees respectively. Italy, Central and South America, Dutch East Indies, Eastern Africa, Belgian Congo and Morocco are sending big orders for American tung seeds for trial plantings. From this it is evident that the need for woodoil in foreign countries is getting greater and greater and that there are movements for reducing the imports of Chinese woodoil.

As to the woodoil industry in China, no new methods are being introduced as regards planting and manufacturing; only the old methods are used. The merchants have little capital and there is no organization of any kind. Should we continue in the same old way, it is quite natural that our market for woodoil will soon follow the failures of our silk and tea trades. What chance is there for expansion?

Other kinds of Chinese oil exported every year are vegetable seed oils, such as, cottonseed oil, rapeseed oil, tea oil, bean oil, groundnut oil, castor seed oil, and sesame seed oil. The marketing of these is also of importance to rural economics. It is unnecessary to say that immediate measures are needed for the planting, manufacturing and marketing of such oils and that an organization must be established to take care of such matters.

However, in view of the poor financial conditions which exist everywhere, it is difficult for an organization like this to be started by merchants. It has, therefore, been decided to do the job officially under the leadership of the Central Government, assisted by the various provincial governments; but taking into consideration the different methods of transacting business as exists in the various districts, it has been decided to request the local merchants to also participate. It is felt that the inclusion of commercial bodies will considerably increase the business nature of such an undertaking. Thus, the proposed organization is one consisting of the Central Government together with the help of the Provincial Governments and merchants of the principal oil producing regions.

We note with regret the one grave defect of Chinese industry which is the lack of organization—just like a pile of sand. The

woodoil industry is no exception. Now that reformation is well under way, it is necessary that the power of the new organization be centralized in the country, so as to make a bolder front towards the outside world. It is felt that reformation and scientific methods must needs be applied to the planting, manufacturing and marketing sides of the industry so as to deal better with export requirements. This is the one step necessary for the work of reformation in any country. The reason why we invite free participation of the individual merchants is to enable them to obtain the benefits of one big controlling organization.

The objects of the company are :—

- (1) The employment of new methods for purification and storage. To use a system of "storage checks" so as to create sufficient financial mobility.
- (2) To use a method of machine pressing so as to materially improve the quality of the oil. Endeavors will be made to extend the tung forest and to improve the tung seeds, so as to produce a better and larger quantity of oil.

In so doing we hope to establish a standard for the grades so as to prevent the malpractice of adulteration—raise the standard of quality, and to establish a uniformity of oil grades for export. For all dealings for spot delivery the grade of goods and times of delivery will be definite. There will be ample financial mobility and fluctuations in prices will be somewhat reduced, whilst a reduction of cost prices will also be effected. In so doing with production increased and outside prestige established, it is reasonable to hope that our industry for woodoil will be definitely improved. In the meantime the methods of transaction and fixing of prices will be left as usual to the individual merchants, as such are beyond the scope of the present organization.

This company is in the process of being established. There is a great deal to be done. We hope very much to secure the help of woodoil merchants whether personally or materially, so as to give the company an early start. The matter is such that concerns the future of our woodoil industry. We trust and believe that all parties concerned will lend us their co-operation and put forth their efforts toward this great undertaking.

A Prospectus for the Formation of the China Vegetable Oil Corporation

1.—This Company is organized to raise the quality of vegetable oils, to establish definite grades, and to revise the methods of oil production and distribution.

2.—The official name of this company is called "The China Vegetable Oil Corp."

3.—This Company is to be jointly owned and managed by officials and merchants, and is incorporated according to the present laws of incorporations.

4.—The main business of this company is to attend to the extraction and storage of wood oil for merchants and to facilitate its transportation and consumption. The scope of the business is as follows :—

- (1) The storage of woodoil, its extraction and purification.
- (2) The storage, extraction and purification of other vegetable oils.
- (3) Matters appertaining to loans, packing credits, customs formalities, transportation and to facilitate dealings.
- (4) The manufacture of oils for lubricating machinery.
- (5) The manufacture of varnishes, lacquers, and other painting materials.

5.—For the sake of united efforts toward improvement, a petition has been sent by the Ministry of Industry and approved by the Executive Yuan, to the effect that no other firm of the same nature will be countenanced.

6.—The Central Office is to be located in Shanghai. The manufacturing stations will be built, one after the other, in the woodoil producing regions according to requirements—as decided by the Board of Directors.

7.—The proclamations of this company are to be made by newspaper announcements and mailed notices.

8.—The capital of this company is to be fixed at \$2,000,000 divided into 20,000 shares of \$100 each. A half of it, that is \$1,000,000, must be paid up, and the other half to be collected in case of need according to the decision of the Board of Directors.

9.—Of the shares of the company The Ministry of Industry will subscribe 5,000 shares or \$500,000, the Provincial Government

of Szechuen, Hupeh, Hunan, Chekiang, and Anhwei 3,000 shares each or \$1,500,000. The Ministry of Industry and the Provincial Governments may sell out to private merchants a half of the shares subscribed until the end of June this year.

In the event the stipulated number of commercial shares be not subscribed by then, the various Governmental offices will have to make good the deficiency by cash, and then gradually get the shares sold.

10.—The shares will bear the full names of the shareholders who must be of Chinese nationality.

11.—The shares are issued in the denominations of 5, 10, 50 and 100.

12.—In case the shares be sold or transferred, the original shareholders will have to put their endorsement on the back of the shares (signature and chop) and send an application to the Company. Such transactions will be only valid when the transfers are duly registered. A transfer fee of one dollar will be charged for each share of any denomination. In case of shareholders becoming deceased it will be necessary to change the names of the shareholders, and the successors will have to furnish the shares and legal evidences thereof when making an application to the company. The shares can only be transferred upon the verification of the evidence. A transfer fee of one dollar per share will be charged.

13.—When shares are entered under a family name, or company, or legal entity, it will be necessary to send in for registration the names and addresses of the representatives.

14.—The company will have a Board of Directors consisting of 19 persons, eight directors representing the Government of which three persons appointed by the Ministry of Industry and one person each by the Provincial Governments of Szechuen, Hupeh, Hunan, Chekiang and Anhwei—and nine directors representing the private merchants of whom one or two from each of the afore-mentioned provinces are to be elected by the merchant shareholders.

15.—Merchant shareholders possessing more than 60 shares are eligible for election to the Board of Directors.

16.—Regulations for the Board of Directors will be enacted separately.

17.—This company will have one general manager, one or two sub-managers, recommended by the Board of Directors, and appointed by the Ministry of Industry, with a tenure of Office of four years. Each factory will have one manager and, if necessary, a sub-manager. These officers will be appointed by the General Manager with the consent of the Board of Directors.

18.—This Company will have seven supervisors, three of them appointed by the governmental side and four elected by the merchants—the latter officers having to hold at least 20 shares each.

19.—The Company will have one attendant supervisor, elected mutually by the Supervisors.

20.—Shareholders' meetings will be held under the names of regular meetings and extraordinary meetings.

21.—Regular meetings are to be held once a year, convened by the Board of Directors, within two months after the closing of the fiscal year.

22.—Extraordinary meetings are convened either by the Board of Directors or by the supervisors when they deem it necessary. Shareholders with over a twentieth of the Company's shares may also request the Board of Directors for convention of such meeting upon the presentation of proposals with reasons.

23.—Shareholders possessing 11 shares or less, will have one vote for each share. Shareholders having 50 shares or less, but more than 11 shares, will have in addition to the above four votes for every five shares in excess of 11 shares. Shareholders holding 100 shares or less, but more than 50 shares, will have in addition to the above, three votes for every five shares in excess of 50 shares. Shareholders having more than 100 shares, will have in addition to the above one vote for every two shares in excess of 100 shares. The voting powers of the official shareholders are to be the same as those of the merchant shareholders.

24.—In case of non-attendance due to various reasons, shareholders may empower other shareholders to act in their stead by the making out of a power-of-attorney with signature and seal.

25.—For convening of regular meetings, one month's previous notice should be given to shareholders; for extraordinary meetings, 15 days previous notice. These notices should contain the reasons for meeting and matters to be discussed.

26.—The chairman of the Board of Directors is to act as the chairman of shareholders' meetings, failing which, the vice-chairman will act in his place.

27.—During shareholders' meetings a quorum is to consist of at least half of the total number of shareholders holding not less than half of the total sum of the Company's shares. No decision may be made without the support of shareholders possessing between them more than half of the number of votes represented by the total number of shareholders attending the meeting.

28.—Upon the termination of the fiscal year, every year one-tenth of the net profit, if any, is to be laid aside as legal reserve. Also eight per cent per annum will be set aside for the official interest on the commercial shares and six per cent per annum will be set aside as interest on the official shares. After that, if there is still any surplus left, same is to be treated as extraordinary interest for shareholders and bonuses for workers, the proportion of which is to be decided by the Board of Directors.

In case the net profit should amount to more than twice the sums allowed for official interests (eight per cent per annum and six per cent per annum) the Ministry of Industry may reserve part of it for future use in other productive enterprises in the various provinces concerned. On the other hand, should the surplus be less than the amount of the official interest for commercial shares, the Ministry of Industry will guarantee the payment of six per cent per annum as interest or make good the payment of six per cent interest.

29.—Matters untouched by this prospectus are to be ruled by the Chinese laws for corporations. Matters of office routine are to be decided separately.

30.—This prospectus is to be made effective when approval is given by the Executive Yuan to the petition submitted by the Ministry of Industry.

Operating Estimate for Business

INCOME :				(a draft)
Refining .. .. .	..	..	..	\$480,000
Storage .. .. .	..	..	..	120,000
Sundries .. .. .	..	..	..	100,000
EXPENDITURE :				
Central office expenses .. .. .	..	..	..	\$ 80,000
Factory expenses .. .. .	..	..	..	120,000
Fuels for refinement .. .. .	..	..	..	160,000
Official interest for capital .. .. .	..	..	..	80,000
Factory depreciation .. .. .	..	..	..	60,000
Totals .. .. .	..	..	..	\$700,000
Profit .. .. .	..	..	..	\$200,000

The China Vegetable Oil Corporation Prospectus of Share-taking

As woodoil is one of the principal exports of China, we have started a company under the name of The China Vegetable Oil Corporation for the sake of improving the quality of woodoil and reforming business methods. Its chief duty is to attend to the storage, extraction, refinement and transportation of woodoil. Besides, drawing up regulations which have been submitted to and approved by the 262nd. Conference of The Executive Yuan, we beg to issue our prospectus for share-taking as follows:—

1.—This company is incorporated as a limited company, to be managed jointly by the Government and merchants.

2.—The Government's shares are to be subscribed by the Ministry of Industry and by the Provincial Governments of Chekiang, Hupeh, Hunan, Anhwei and Szechuen.

3.—The Central Office of the company is to be located in Shanghai, and working factories are to be opened, one after the other, in the woodoil producing regions.

4.—The capital of the company is \$2,000,000 divisible into 20,000 shares of \$100 each, half of which is to be paid in upon subscription.

5.—Inasmuch as half of the shares have already been taken by the Government, it has been decided to set aside 10,000 shares for open subscription by private merchants. This is done to promote the co-operation of the government and merchants and to enable the public to share in the benefits of this undertaking.

6.—Shares are to show the names of holders and to be issued in denominations of 5, 10, 50 and 100.

7.—Shareholders are limited to people of Chinese nationality.

8.—The official interest for commercial and governmental shares is to be eight per cent per annum and six per cent per annum respectively. In case the profits be insufficient for the official interest for commercial shares, the Ministry of Industry will guarantee or make good the payment of six per cent per annum interest for such shares.

9.—Holders of more than 60 commercial shares are qualified to be elected as director of the company. Holders of more than 20 shares as supervisors.

10.—Concerning the storage, extraction, refinement and transportation of woodoil, a petition has been sent by the Ministry of Industry to the Executive Yuan, forbidding the existence of another organization of a similar nature throughout the country.

11.—The temporary office of this company is located in the Foreign Trade Bureau, Shanghai, and temporary branch offices in the Provincial Ministry of Construction of Chekiang, Hupeh, Hunan, Anhwei and Szechuen. Communications may be made either personally or by letter to the above places.

12.—Subscribers must make applications for shares and effect the necessary payments and safely keep the official receipts.

13.—The amount for payment of shares is to be remitted to the temporary offices of this company.

14.—The time limit for making application for shares and payment is to be proclaimed by newspaper announcements.

15.—Matters untouched by this brief prospectus are to be governed by the Government's ruling for corporations.

Promoter : THE MINISTRY OF INDUSTRY.

Committee of Preparations :

Chief of the Bureau of Construction of—
Chekiang Province, Mr. Oo Ting-shaw.
Hupeh Province, Mr. Liu Shur-bang.
Hunan Province, Mr. Yu Chie-chuan.
Anhwei Province, Mr. Liu Yee-an.
Szechuen Province, Mr. Lu Tso-fu.

Chairman of the Committee of Preparations, Vice Chief of the Bureau of Foreign Trade : Mr. Chang Kia-chi.

"Modern Canton"

There have been remarkable results in constructing modern Canton and a book, no less remarkable, has been written on these results. Edward Bing Shuey Lee, whose "Two Years of the Japan-China Undeclared War," brought him into prominence as a Chinese-English writing journalist, attacks in his recent publication, "Modern Canton," the foreign contention that there is something uniquely foreign about the transformation of "mud flats" into foreign concessions. Accordingly, the whole book is one refutation and the results achieved up to date in transforming Canton in fact should give evidence that the "laying of roads, installation of a sewerage system, harbor and wharf construction, land reclamation and so on, are all feats of engineering which can be grasped by any normal technically-inclined person with a few years of college training, polished by practical experience," thereby pointing out that "capable Chinese engineers are now found everywhere." Hence the construction of 134,136 meters of roads (90 miles) in 15 years, of modern office and residential buildings from 1927 to 1934, to the estimated expenditure of \$121,880,000, the Inner harbor project, the completion of the Canton-Hankow railway and many other huge projects outlined in this book, were planned and carried out by an all-Chinese "Canton Planning and Construction Committee."

The editor of the *China Republic* and one-time Editor of the *Peking Leader* gives a careful picture of the developments in Canton. He points out how the town planning scheme directed and limited the area to which it was applied and that the enormous success was based upon a thorough survey and understanding of existing conditions. Detailing his work in 18 chapters, the author himself achieved a marvellous result, far excelling hitherto published efforts, and they are not few, to get the public acquainted with Canton's rebuilding.

Technically informative, the book displays all the facts and necessary items for modern civic planning considered by the Canton Planning and Construction Committee, such as Historical features, natural topography and climate, population, health, social conditions and land values which had to be thoroughly considered and understood before actual steps were taken to realize the modernization of a city like Canton with its peculiar history and present policies, influencing the whole of the republic, and moreover representing South-China's foreign trade center.

Far Eastern Ports: Their Future Developments

By Professor C. A. MIDDLETON SMITH, M.Sc., M.I.Mech.E., Taikoo Professor of Engineering in the University of Hongkong in "The Dock and Harbor Authority"

IN these days the Far East so often appears in the headlines of English newspapers that there is little need to dwell upon the importance to world economics of that part of the world. The volume of shipping on the Pacific Ocean has increased enormously in the last century and, in comparatively recent years, some of the Far Eastern ports have been developed in the endeavor to provide the required facilities. Many schemes for port development have been proposed, and no doubt some of them will be carried out in the not distant future. British companies still retain a premier place in the shipping returns of the Far East, although their position has been challenged.

The great increase in the volume of shipping using Far Eastern ports have compelled those interested seriously to consider the improvement of existing ports and the possibility of developing new ones.

During recent years Japan and the United States have entered into competition with European steamship lines on the Pacific, in a very determined manner.

A British authority on economics has written of China:—"There is no country in Europe or in Asia with a greater potential wealth. Modern means of transport and other communications must be established to permit such development to take place." An eminent Chinese has written that the economic, social and political future of China "all hinge on rapid and cheap means of communication."

That fact is now fully recognized by all Chinese Governments. In the old days the attitude of Chinese officials was one of opposition

to foreign trade. There has been, in this century, a complete swing of the pendulum. Practically all officials in China to-day—many of whom have been educated abroad—clamor for foreign trade, not only to increase the Custom's Service revenue, but to modernize the industries, and to develop natural resources.

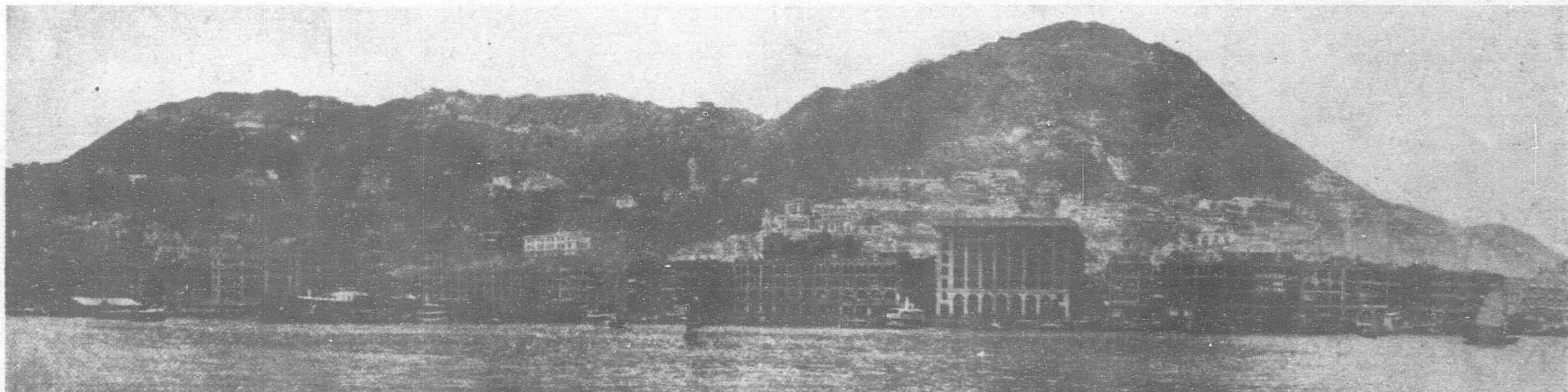
In no country in the world to-day is the need of port development greater than in China. Valuable work has been done in recent years in this connection in Shanghai, Hongkong and other ports, but more is required.

The dramatic evolution of Japan, from an internationally unimportant State into a world-power, has made all educated Chinese anxious to modernize China. That was the main urge of the propaganda of China's national hero of the 1912 revolution, Dr. Sun Yat-sen; a prominent feature of that propaganda was the improvement of the waterways and ports of China.

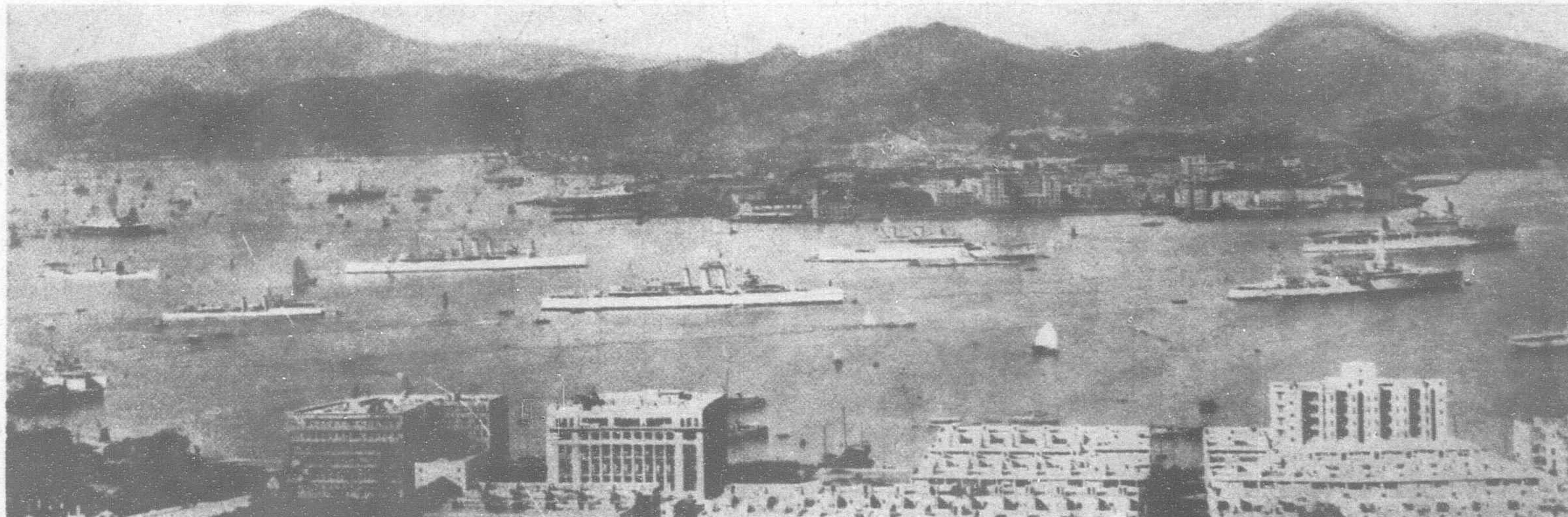
British Interests in the Far East

The two impediments to rapid progress in such matters have been and are (1) international political complications, not improved by the tension between Russia and Japan; (2) financial difficulties; (3) lack of a unified Government in China.

In spite of these, and other difficulties, progress is being made. The enormous trade potentialities of the Western shores of the Pacific, including China, French Indo-China, Siam and Malaya and the huge islands to the South (Java, Sumatra, Borneo, etc.) make ports in those parts of the world of tremendous interest to all



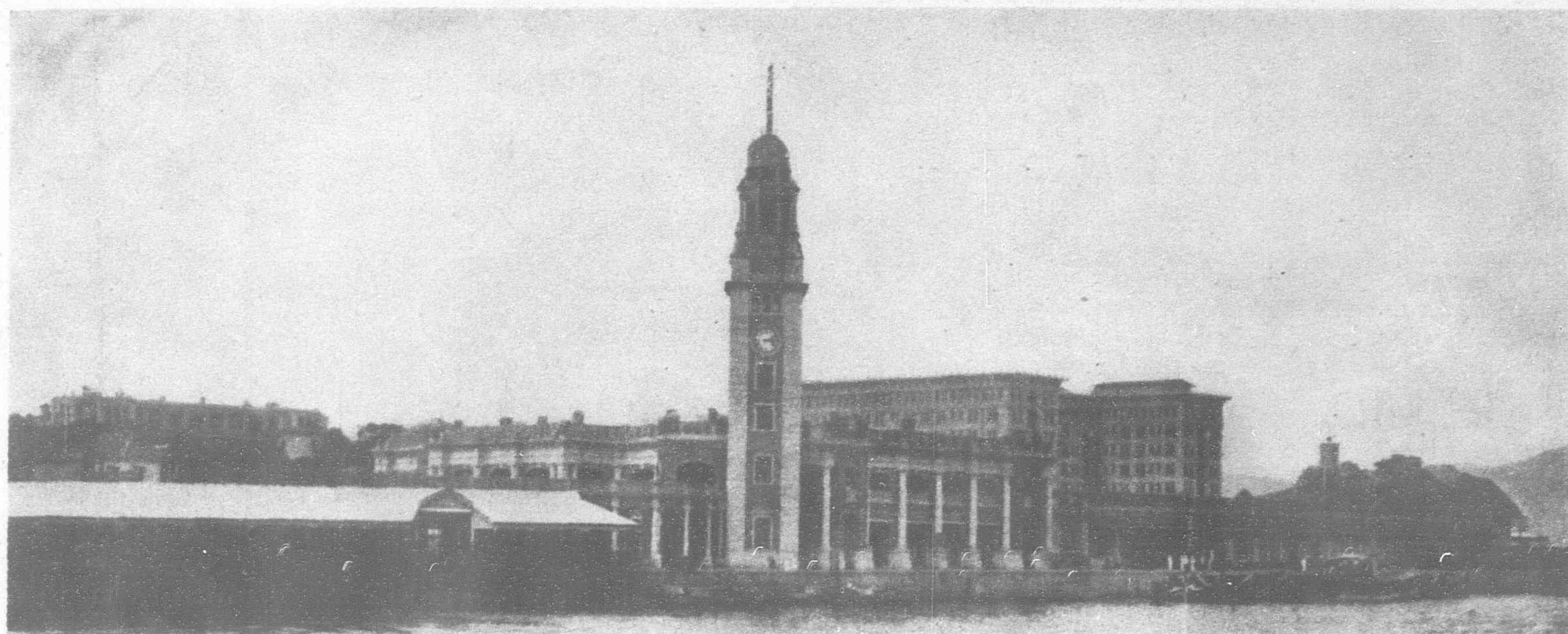
View of the waterfront of Hongkong Island, showing portion of the City of Victoria and the Peak rising to 1,720 feet above sea level. All the buildings on the waterfront and most of the City of Victoria is on land reclaimed from the harbor



British warships in Hongkong Harbor as seen from South side of the harbor, showing Kowloon on North side with the hills behind. Kowloon on the mainland is the terminus for the Kowloon-Hankow Railway. Kowloon and a large area behind it of about 300 square miles is British territory



Map 1—Showing Ports of the Far East



The Kowloon Railway Station and Clock Tower. This is to be the Southern terminus of the Hongkong-Hankow Railway. The through line has just been completed and it will be possible shortly to travel by rail from Hongkong to Calais

interested in shipping. Their importance must increase each year. The chief ports in the Far East are shown on Maps (1) and (2).

Singapore, Hongkong, Shanghai and Kobe (Japan) are at present the four most important ports in the Far East. In the first three the British have invested vast sums and have enormous trade interests.

Consider the (approximate) figures for tonnage entering various ports in the year 1932.

PORTS OF THE WORLD AND TONNAGE ENTERING THEM IN 1932
(IN MILLIONS)

Locality and Name of Port	Tons
CHINA AND JAPAN.	
Shanghai	19 $\frac{1}{2}$
Hongkong (excluding junks and launches) ..	19 $\frac{1}{2}$
Kobe	22 $\frac{1}{4}$
Osaka	14 $\frac{1}{2}$
Yokohama (foreign only)	14 $\frac{1}{2}$
SOUTHERN ASIA, JAVA, AUSTRALASIA.	
Tsingtao	3 $\frac{1}{4}$
Singapore	14 $\frac{1}{4}$
Batavia	6
Manila	6
Sydney	9
Melbourne	6
Calcutta	4
AMERICAS.	
New York (foreign trade only)	26
Los Angeles	19 $\frac{1}{4}$
San Francisco	18 $\frac{1}{2}$
Buenos Aires	15
Vancouver	10 $\frac{3}{4}$
EUROPE.	
London	25
Hamburg	18 $\frac{1}{4}$
Marseilles	15 $\frac{3}{4}$
Southampton	10 $\frac{1}{4}$
Glasgow	7 $\frac{1}{4}$
Amsterdam	4 $\frac{3}{4}$

N.B.—The above figures are approximate, in some cases being obtained by scaling diagrams. They are, however, of comparative value.

A noticeable feature in the tonnage returns for world ports is that whereas Kobe, London, New York, Singapore all reached a peak in or around 1930, and have since declined, Shanghai and Hongkong have steadily risen in value.

The British base in the Far East is the Crown Colony of Hongkong. In Shanghai the majority on the Municipal Council of the International Settlement are of British nationality. The largest share of the coastal trade of China is in the hands of British shipping companies. In 1935 the total tonnage cleared in Chinese ports (excluding Hongkong) was 18,541,804 tons British, and next came the Japanese with a total of 9,197,376 tons.

For Hongkong the 1935 returns are not yet available, but for December the total British tonnage was 121,040, Dutch 7,712 and Japanese 1,653 tons. In the boom year of 1922 Hongkong cleared more tonnage than any other port in the world.

Japan and the Far Eastern Trade

The immense development of Japanese ports and shipping during the last half-a-century will be discussed later. First of all the problems of China will be considered in detail, as these have a very great bearing upon the future of the rest of the world as well as of Japan. But mention must be made of the fact that, during the last five years especially, Japan has made rapid strides in increasing her commercial interests on the mainland of Asia. Various ports that were formerly under the control of the Chinese Government are now controlled by Japan. In Northern China that fact has been of serious consequence to British commercial interests.

The two outstanding factors in the Far East which make port development work different to that carried out in Britain and many other parts of the world are (1) cheapness of labor; (2) the terrific force of winds and waves due to typhoons.

Both of these factors demand that engineers who are responsible for that class of work shall be experienced in Far Eastern conditions.

It is not unfair to say that, although Japanese engineers have done important port works in their own country, and on the mainland, yet in China and in the Southern Pacific European engineers have been responsible for the most important works. At the present time there are no Chinese engineers capable of designing and carrying out such difficult work, but no doubt they will be able to do so in time. Nor are there any Chinese contractors with the financial and technical resources needed for such work; although European engineers find Chinese contractors useful for smaller sub-contracts.

The Early Days

It is claimed by the Chinese that they have a record as far back as the Chow dynasty (1122-249 B.C.) of trade between Canton and eight neighboring nations. The silk and porcelain of China first brought the fame of the country to Europe, but the early traders were concerned with an overland passage to India, whence the silk found its way to Rome.

It is, however, clear that the Phoenicians, Carthaginians, Syrians and other peoples of Western Asia knew the sea route to China before the Han dynasty (206 B.C.), although it seems doubtful whether Kattigara, mentioned as the extreme Easterly point visited by their ships, was the name given to Rangoon, Malacca, or Canton.

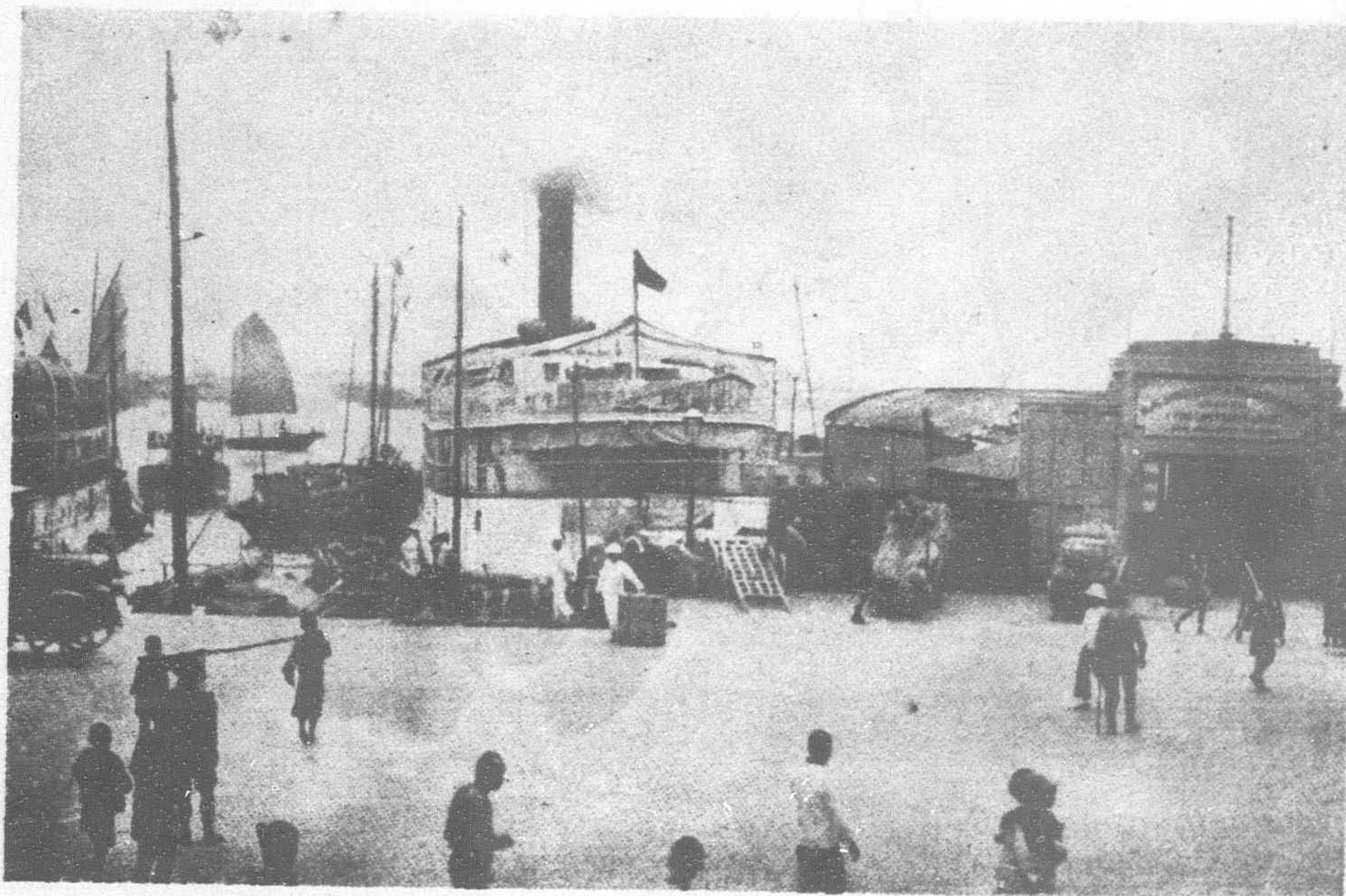
It is worth noting that the Canton Inspectorate of Maritime Trade was established in the eighth century, and, from the earliest times of sea-borne commerce in the Far East, junks sailed from Canton to Ceylon, India and Indo-China.

The publication of a report by Marco Polo (A.D. 1271), who had journeyed to China overland, made adventurous mariners in Europe seek a sea route to the Indies, which term included China, a land they believed to be full of riches.

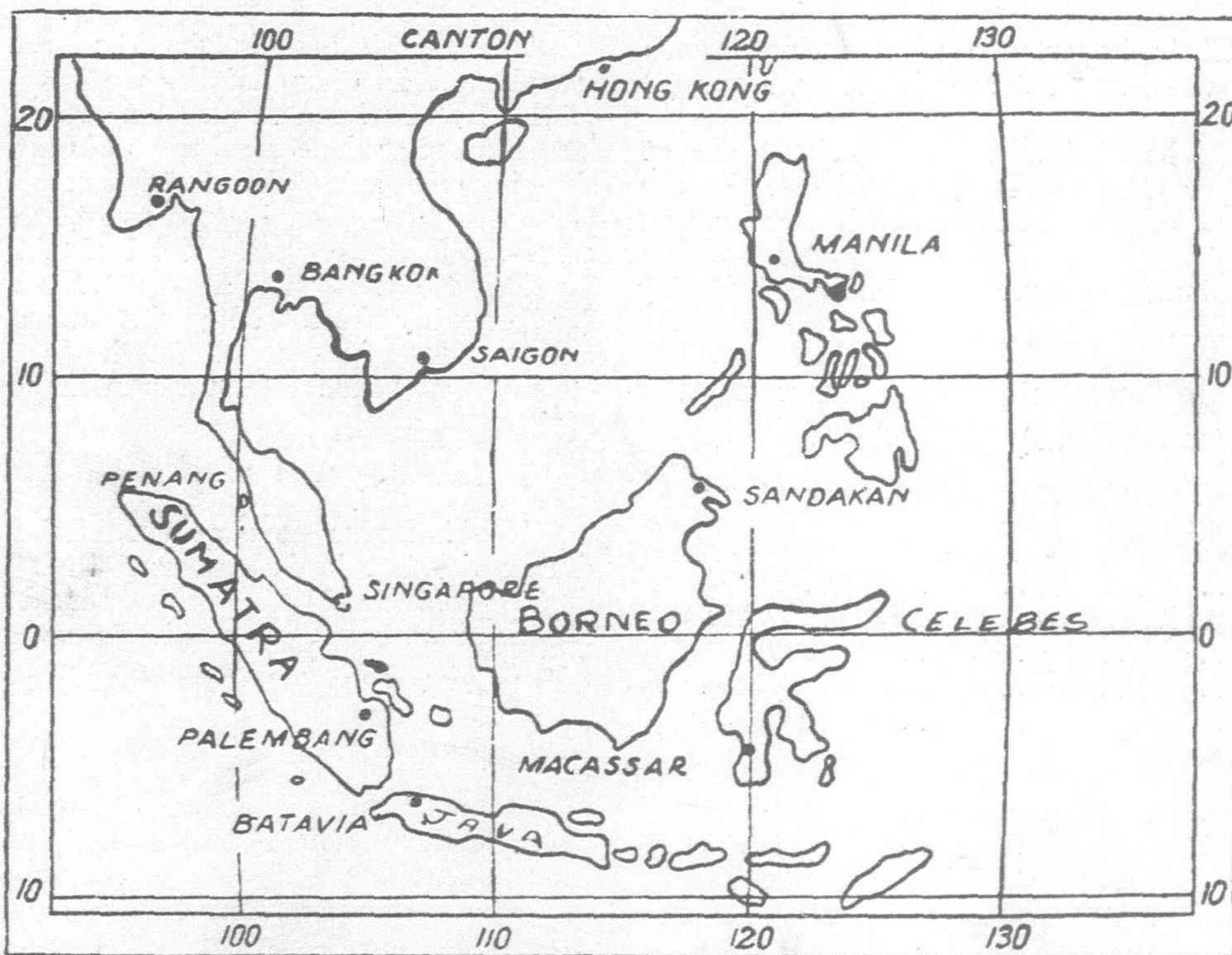
Direct trade between Europe and China commenced in A.D. 1516, when Perestrello sailed from Malacca in a prospecting expedition to China. A year later another Portuguese, Andrade, arrived in Canton with two ships and received permission from the Viceroy to trade. Subsequent troubles in Canton and other ports in S.E. China led the Portuguese to establish themselves in Macao in 1557.

During the 18th century Macao was the chief port for Western trade with China, because of its proximity to the then most populous city in China, Canton. That river port is about 100 miles inland from the sea. European ocean-going vessels have never been able to reach Canton. China coasting vessels use that port. Macao is situated at one of the delta mouths of the Canton River. It is now of no importance as a port.

Trade with the East India Company and Canton nominally began in 1680, and the Company had a monopoly of British trade until 1834.



A wharf in Hongkong with a Canton river steamer alongside



Map 2—Showing the Far Eastern Ports South of Hongkong

Canton was, until 1842, the only port in Chinese territory open to foreign trade. The British and other foreign merchants lived in a compound, called the Factories. No European women were allowed to visit Canton, so they stayed in Macao. But the early spacious days could not last. The West wanted more trade with China. Treaties with China, from 1842 onwards, have led to the total number of ports (mostly river ports) where foreign Customs dues are collected, reaching a total of 47 in China.

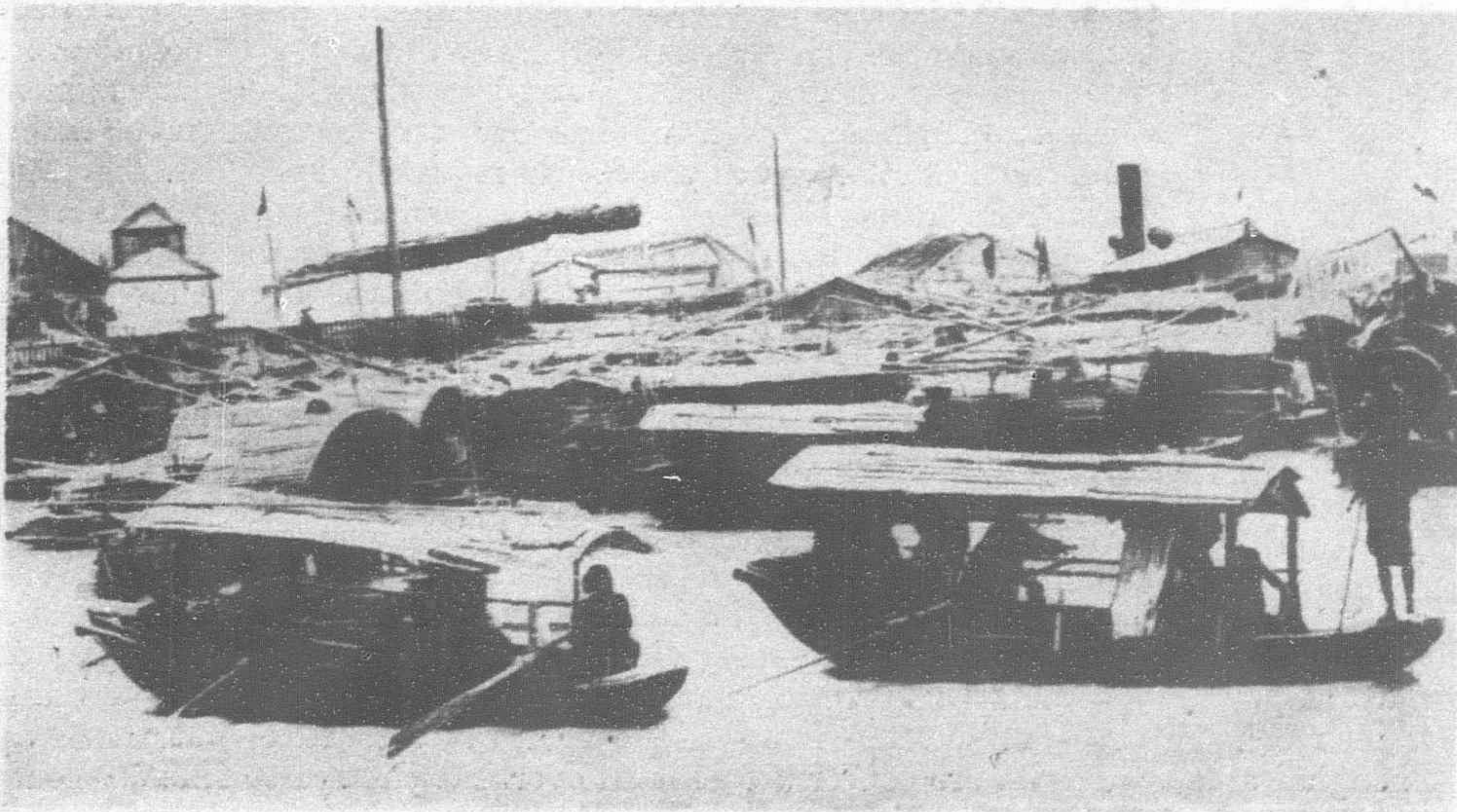
In the early 17th century Europeans traded in Japan, but owing to the interference of missionaries with the politics of the

country very little trade was done until Japan decided to seek foreign intercourse about 70 years ago.

The Importance of Hongkong

The cession of Hongkong to the British in 1841, and its subsequent rapid development, has made it one of the largest ports in the world. The development of Hongkong led to a great diminution in the trade of Macao, which is now of insignificant importance as a port, and is unlikely to become of any importance in the future, although unsuccessful efforts in port development, to attract more shipping, have been made in recent years.

Many of the great ports of the world are ugly, being set on the shores of flat estuaries, and giving an impression of a collection of wharves, warehouses, mean dwellings and oil tanks. Shanghai and Liverpool are like that.



Sampans in Canton Harbor

But some of the Far Eastern ports—Singapore, Hongkong, Nagasaki, etc.—are very beautiful with fairy islands, delightful foliage, a harbor like a lake enclosed by jagged hills; they provide scenery that thrills the visitors.

In considering the ports of the Far East we have to remember their comparatively recent development, as well as the great length of coast line, and the formation of the land. The ports in Japan—Yokohama, Kobe, Nagoya, Nagasaki, etc.—have grown rapidly in importance in this century. On the mainland of Asia there are, on the coast, Vladivostok, Dairen, Tientsin, Chefoo, Tsingtao, Shanghai, Foochow, Amoy, Swatow, Hongkong and Pakhoi in Russian, Japanese, Chinese and British Territory. There are numerous ports inland on the rivers in China, the most important being Canton in the South and Hankow in Central China on the Yangtzekiang; that river is navigable at certain periods of the year to ocean steamers and large warships 600 miles inland, from the coast, up to Hankow. None of the other river ports in China can berth large ocean-going steamers, but many river craft carry the commerce to and from the river ports and the coast. Further South than Pakhoi there are ports in French Indo-China, Dutch East Indies, Malaya; nor must we omit mention of the Philippine Islands.

Some of the most important work, in connection with port development, carried out in recent years in the Far East has been accomplished by the Netherlands Harbor Works Co. of Amsterdam. That firm was formed in 1912, and in 1923 the firm of contractors "Grotuis," which constructed the harbors of Macassar and Belawan, in the Dutch East Indies was merged into the first-named firm, thereby considerably increasing its plant and adding to the ranks of its technical staff a number of highly-skilled and experienced workers.

It may be said that this firm has specialized in carrying out harbor schemes, erecting equipment and accessory works such as reclamations, etc., in the Far East. The accompanying pictures show some of the methods adopted to check the force of the seas.

Their most notable works in the Far East are given below.

In Shanghai (1912-16) some 5,500,000 cubic yards were dredged and 5,320,000 cubic yards reclaimed by wet process; the reclaimed area was 2,500,000 square yards.

In Chefoo (1915-21) 2,300,000 cubic yards were dredged. The stone quarried was 890,000 tons; the concreting and masonry was 130,000 cubic yards; the breakwaters totalled 2,600 feet in length and the moles were 5,873 feet in length. The quay walls were 600 feet in length.

Enormous works were carried out in Macao, the Portuguese Colony about 40 miles south of Hongkong (1922-27).

In Hongkong (1924-26) extensive works of dredging, construction of quay walls, etc., were accomplished. A further contract in Hongkong was fulfilled in 1927-29.

A bund wall with back-filling was built in Canton (1930-31).

A big contract at Hulutao (N. China) involving breakwaters 5,100 feet long, quay walls 3,800 feet long, dredging and reclaiming works with retaining-walls 7,500 feet long, has been carried out.

At Amoy (1931-33) a bund-wall was built. And in Hongkong (1932-34) a slipway for ships 3,000 tons weight was constructed.

All of these works have been successfully carried out and have greatly encouraged other works to be planned for future port development in the Far East.

The Coast Line of China

In order to appreciate the development of the ports of China, it is essential to remember that the coast line south of the mouth of the River Yangtzekiang is very different to that of the north.

A massive spur of the Himalayas crosses China from India to the Pacific forming a watershed. Throughout its course this mountain range throws off smaller spurs to the south and east. All of these jut out into the sea. The result is that all along the Southern sea-board of China there is a continuous belt of almost innumerable rugged islands. These islands, with the promontories facing them on the mainland, form, along a coast, of 1,200 miles in extent, a remarkably close series of the safest, land-locked harbors. Many of them are at once easy of access from the sea, and large enough to contain the whole British navy. From a commercial point of view many are useless, because the hinterland is not conducive to port development.

The British Crown Colony of Hongkong includes Hongkong Island, a member of this belt of islands. One of the finest harbors in the world, and its geographical position *vis-à-vis* China's great

southern waterways, has transformed Hongkong Island from its derelict condition of 1841, to a mighty entrepôt of commerce in 1936. It is comparable to Alexandria, at the head of a great river system. The Pearl River has a delta mouth adjacent to Hongkong. Forty miles inland it splits into a vast network of streams that wind through a densely populated and very fertile area. Nearly all of the imports and exports for South China are distributed from Hongkong along the rivers. Moreover, Hongkong is a distributing center for goods to and from Europe, the Americas and Southern Asia, Australia, etc.



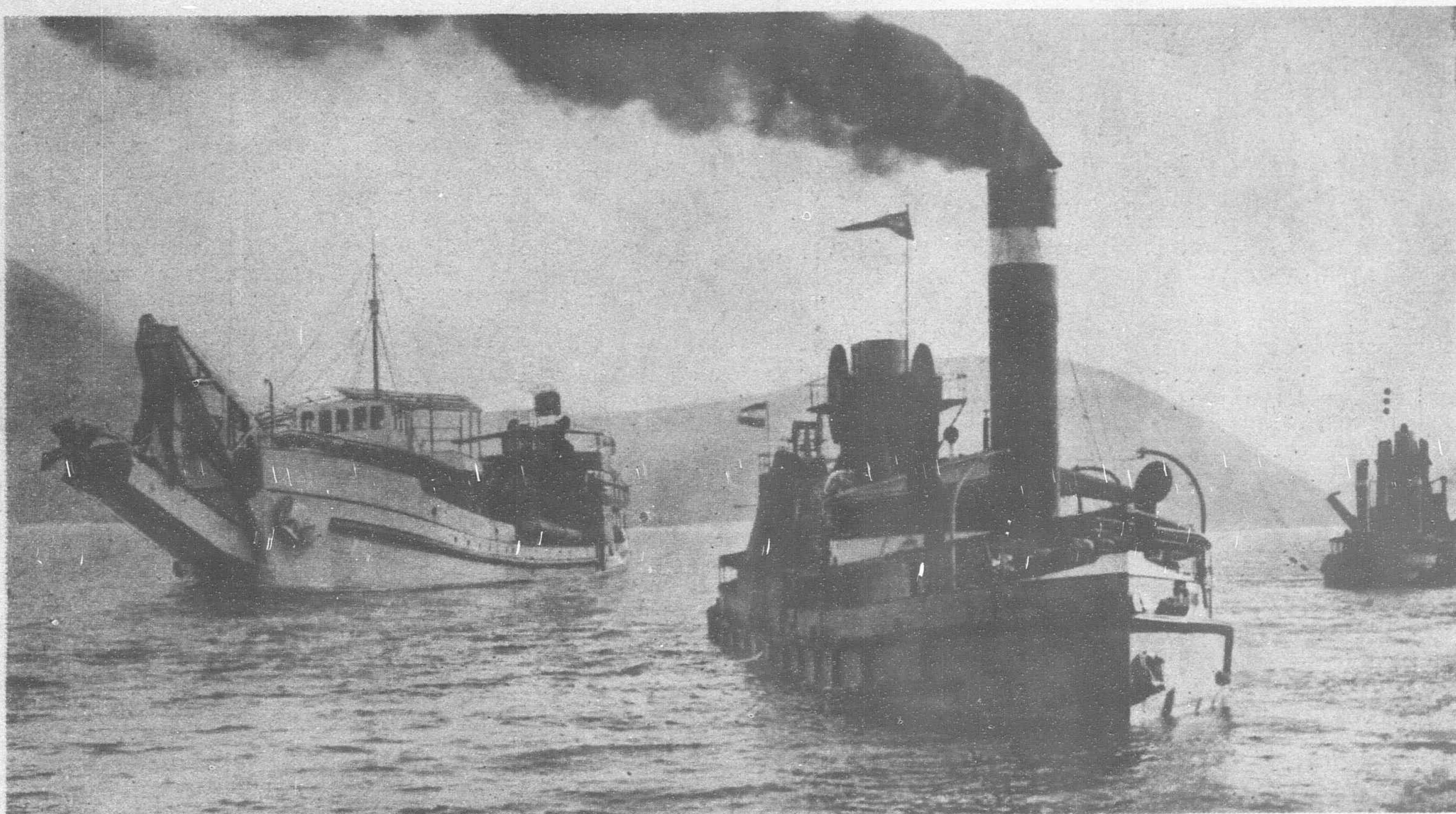
A typical natural typhoon shelter off the China Coast

Unlike South China and Japan, the Northern Coast of China has practically neither harbor, nor islands, and so has offered no inducements of facilities to its inhabitants to go to sea.

We shall realize, later, that efforts have been made in recent years to remedy these defects, but it is desired to emphasize, now, the very great difference in the coast lines of China situated South and North of Shanghai. That difference is reflected in the temperaments of the people living in those parts. The enterprise of the Japanese is due, in no small measure, to their rugged coast line. In the Far East the Japanese and the Southern Chinese have certain characteristics resembling those of the Anglo-Saxons. They are the characteristics of a maritime people.

The Southern Chinese who have occupied the coast line with natural harbors are hardy, daring and adventurous mariners and fishermen. With the partial exception of the natives around the mountainous promontory in the province of Shantung, which includes the ports of Hulutao, Tsingtao, Weihaiwei and Chefoo, the inhabitants of the Northern coastline are about the tamest of the Chinese. The very fact that an inland canal—the Grand Canal—has been constructed, beginning where the Northern coast-line begins, and running parallel with it throughout its extent for about 1,000 miles, as a medium of traffic, proves that the Northern Chinese are not a maritime people.

The sea invites man to conquest, to profit and to acquisition by trade. The land attaches man to the soil. On the sea men put their property and even their lives in danger, and it is that very fact which elevates sea traffic and makes it something brave and noble. The mariner must have courage; but bravery must



Powerful equipment enables the Netherlands Harbor Works Co. to overcome technical difficulties. Some of the larger floating dredgers are shown above. From left to right: the Hopper-cutter-suction dredger "Rotterdam," steaming from Holland to China, the Bucket-dredger "Karang" homeward bound from Hongkong and the Bucket-dredger "Hongkong"

be associated with prudence and even craft, since he has to deal with the most uncertain and deceitful element, the sea. To that deceit and force, from Nature, man opposes his own handiwork, a vessel, relying merely on his courage and presence of mind for safety. He passes from the firm land to the unstable sea, taking with him his fabrication. And the ship, this swan of the sea, with its light and rounded movements, traverses the watery plain and circumnavigates our planet. It is an instrument that reveals in a marvellous manner man's courage, his understanding and his powers of invention. But it has increased in size and in draught; deep harbors and proper port facilities are now essential for the safety of vessels and speedy handling of their cargo.

It is due to the great difference in the coast line of North and South China that we find such a contrast in the characteristics of the North-Eastern and South-Eastern Chinese people. It is also due to this difference in coast line that, on the China coast, the finest natural harbor and the best facilities for ship repairs are to be found at Hongkong. The situation of Shanghai, at the mouth of China's biggest waterway and artery of commerce, has made that city the most populous and, as a trade center, of paramount importance in China. But, as will be described later, there have been past difficulties to be overcome in Shanghai to make it a modern port that have never been encountered in Hongkong.

On the other hand, the geographical situation of Shanghai has led to its amazing development as one of the greatest ports in the world. The engineering difficulties surmounted are of intense interest.

The maritime characteristics of the South-Eastern Chinese have made them a great factor in the development of Malaya, the Dutch East Indies, and many other ports of the world. They have been adventurous and enterprising. Hundreds of thousands have left their homes in South China to emigrate and settle elsewhere. They have, in the mass, acquired wealth and become admirable citizens under a foreign flag.

Practically all of the ships that sail from one coast of the Pacific to another carry Chinese crews, stewards, etc. These also are from the South-East part of China.

The West and the Far East

China tea, commercially, is not of the importance it was a hundred years ago, being ousted by the products of Ceylon, India,

and Java; yet some trade remains. The three ports of Foochow, Amoy and Swatow, with reverine harbors, in South China, will always be associated with the great days of the tea trade and the famous "China clippers," sailing vessels that raced from China to London for the prize and fame of being first with a cargo of the new season's tea.

Nor must mention of "The Opium clippers" of the past be omitted: of these Commander Basil Lubbock writes: "The captains of the little opium clippers, not one of which exceeded 500 tons register, had to navigate unsurveyed, uncharted waters full of reefs and shoals, of roaring waterspouts, rippling currents and black raging squalls. They had . . . to battle to the death with the screeching typhoon of the China sea."

"These fine-lined, well-built, heavily-rigged clipper barques, brigs and schooners, sailing under the British and American flags, not only trained an incomparable set of seamen for the Mercantile Marines, but were the chief means whereby China and Japan were opened up to the outside world."

Parsee, Bengalee, Malay, Chinese and Jew contended with the Britisher, the American, the Dutchman, the Portuguese, and the Spaniard for the spoils of the Far East in the early days of the 19th century. There were only the natural harbors to shelter the vessels against the dreaded typhoons, with wind velocities up to 130 miles per hour. There were practically no man-made port facilities in those days.

The Spaniards, in the 16th century, appeared in Canton, using Manila as their base. The bulk of the trade between China and the Philippines was, however, in the hands of the Chinese. The trade has developed steadily during this century since the day when the flag of the United States of America was first flown in the Philippine islands.

The first American ship to reach China arrived in 1784, and from the outset American shipping rapidly grew in volume. There came a decline due to the Civil War in the U.S.A., and the change from wooden to iron ships. But the Americans opened up the ports of Japan to foreign trade. In recent years, especially since the war, we have seen a great increase in the tonnage of American shipping in the Far East.

It was chiefly the initiative of the early British traders that led to the creation of what were—and still are—called Treaty Ports in China (1842). The subsequent history of British Commerce in China is really the tale of the commerce of China, for



Chinese Junks. Thousands of these sailing vessels sail the rivers and the coast line of China carrying cargo.

Great Britain has been the leader in the trade, shipping, industry and finance, until to-day. Japan and the U.S.A. are now keen competitors in shipping, industry and finance.

In these days, with ships of 20,000 tons and upwards frequenting Far Eastern waters, port facilities are of the utmost importance. Large sums of money have been invested in wharves, docks, "godowns" (store-houses) and repair establishments in the Far East. In that respect Hongkong is fortunate in that it is the terminal port for shipping plying between the Far East and the Americas, and for certain lines from Australia to the Far East. Yokohama is the terminal port for most of the ships plying between Europe and the Far East. In Hongkong, Shanghai and Yokohama there are facilities for general ship repairs.

Pacific Port Developments

As ships in the Pacific may come through the Suez or the Panama Canal, it is obvious that the size of vessels will be affected by their present depths and projected improvements. It is unlikely that any ships of the size of the big Atlantic liners will engage in the permanent trade of the Far East. From time to time large vessels, such as the *Empress of Britain*, the *Aquitania*, etc., appear in the ports of the Far East, on round-the-world tourist trips, but as they are concerned with passengers only, wharfage and dock facilities for them are not essential, although wharfage is now available in Hongkong.

The depth of water available at Shanghai, ports in Japan and on the Pacific coast of Canada and the U.S.A., are given below. Hongkong harbor can accommodate a ship of any size.

Ports	Maximum Depth of Water in the Channel or on the Bar attained at		Open Quays Available at
	L.W.O.S.T. ft.	H.W.O.N.T. ft.	L.W.O.S.T. ft.
Shanghai	25	31	35
Kobe	36	—	36
Yokohama	33	37½	35
Victoria	30	36	30
Vancouver	35	43	35
Seattle	600	607	43
Portland	33	37½	28
San Francisco ..	32½	36	35

From the above it is fair to infer that ships with a draught of 34 feet are unlikely to frequent Pacific ports for some years to come. Quay walls built to accommodate vessels drawing 34 feet will require 36 feet depth of water alongside at L.W.O.S.T.

Coasting Steamers

Some idea of the enormous proportion of the coasting trade done by coaster-steamers (about 5,000 to 10,000 tons), river steamboats and junks can be obtained from Hongkong figures. In a "boom" year (1923) of the value of merchandise exported 84½ per cent was borne by coaster-steamers, river steamboats and junks and 15½ per cent by ocean-going steamers. For imports the figures were 66½ per cent and 33½ per cent.

Figures for the maximum draught (fully loaded) and length, of vessels frequenting Hongkong are given below, as they give an idea of the vessels frequenting Far Eastern ports.

Class of Vessel	Maximum Draught Fully Loaded in ft.	Length (overall) in ft.
Ocean-going	32	627
Coaster	22½	325
River Steamboats ..	13	290
Junks	11	70
Barges	7½	80

These coasters are used for inter-port trade on the Pacific and distribute cargo from Hongkong and Shanghai to China ports at which ocean-going vessels do not call.

The following table gives the controlling depth of water at L.W.O.S.T. to or at the Far Eastern coast ports mentioned therein, and the draught to which vessels may load to enter or leave these ports at high water or neap tides.

Port	Available Depth in approach channels or at the port L.W.O.S.T. in feet	Maximum Draught to which vessels may be loaded to enter or leave at H.W.O.N.T. in feet
Bangkok	4 to 6	11 to 15
Koh-si-chang (outside Bangkok bar)	Vessels can load to any draught	
Saigon	23	25½
Haiphong	15¾	24
Hongay	12	20
Canton	7¾	14
Swatow	16	18
Amoy	Vessels can load to any draught	
Foochow	8 to 9	24½
Shanghai	26	28
Hongkong	Any draught in the stream	

The International Congress of Navigation, London, 1923, considered that a port providing 30 feet of water L.W.O.S.T. may be considered a first-class port. And, except for the Atlantic service, it is difficult to justify a quay side of more than 35 feet at L.W.O.S.T. for many years to come.

The Search for Far Cathay

The story of the Far Eastern ports is closely intermingled with the romance of the early British pioneers of commerce. The drama of their sustained efforts to establish trade between our own small island and the vast and populous Empires of the Orient forms a tale unique in hazards, marvellous in episodes of unusual bravery, and astonishing for the enterprise and tenacity of purpose revealed.

To reach the riches and the markets of the far-distant Cathay became the aim alike of statesmen, merchant and mariner, and out of their efforts grew, not only Britain's sea-power, but, in a great measure, her overseas Empire.

That first voyage from England for "the discovery of Cathay" was the beginning of a new era in navigation and in world history. The directing minds in London had great vision and wonderful perseverance in the face of many discouragements. But first in our thoughts are the countless brave British sailors and bold merchants who met, without complaint, the risk of making long sea voyages and residing in countries where piracy and racial hatred and uncharted seas made life unsafe, and where disease was rampant.

Changes are taking place rapidly in China. It is considered "news" for headlines in English papers when fighting and banditry

takes place, but when ports are developed, quays built, harbors dredged and bigger ships arrive in the Far East, nobody thinks that is "news." But the big square lateen sails of the junks are passing down the river of memory with the clumsy vessels they drive. Steamships, railways, roads, radio and mines are bringing these changes to pass, not only in the Far East, but in all parts of Asia as well. The port of Shanghai has a population exceeding three millions; and it seems certain that one day it will be the most populous city in the world, for the imports and exports of the vast Yangtze-kiang basin must pass through it. In addition, it is already a great industrial center—both the Liverpool and the Manchester of China.

Thousands of young Chinese have received, or are receiving, a modern technical training. The English language is becoming the language of commerce in the Far East. "Pidgin English" is passing away with other picturesque and uncomfortable features of life in Far Eastern ports. Although there is only one written language for the whole of China, there are numerous dialects; Chinese from the ports of Shanghai, Foochow, Amoy, Swatow and Canton speak in different dialects, and to converse with each other, if educated, use the English language, as do many Japanese and most of the foreigners in the Far East.

The following tables will give the reader some idea of the great importance of the Far East to British shipping interests.

Millions of pounds sterling of British capital are invested in wharves, godowns, docks and ship buildings and repair establishments in China.

TABLE I.—VESSELS ENTERED FROM AND CLEARED FOR ABROAD IN CHINESE PORTS: BY FLAGS

Flag	Total 1935	
	January-December No.	Tons
American	1,577	3,711,594
British	13,341	18,541,804
Chinese	47,123	7,622,430
Danish	347	898,535
Finnish	3	8,347
French	379	1,252,784
German	457	1,871,266
Greek	31	88,681
Italian	78	445,469
Japanese	5,105	9,197,376
Netherlands	393	1,358,867
Norwegian	889	1,839,226
Panamanian	17	61,833
Portuguese	3,255	829,608
Swedish	78	293,525
U.S.S.R. (Russian)	32	62,436
Others	6	21,790
Total, Jan.-Dec. 1935	73,111	48,105,571

N.B.—Tables I. and II. are from the Chinese Maritime Customs Returns. Hongkong is considered "Abroad." A number of the Chinese vessels clear to and from Hongkong and foreign ports. While, from the above table the average tonnage of British vessels works out at about 1,400 tons, that of Chinese vessels average 160 tons about.

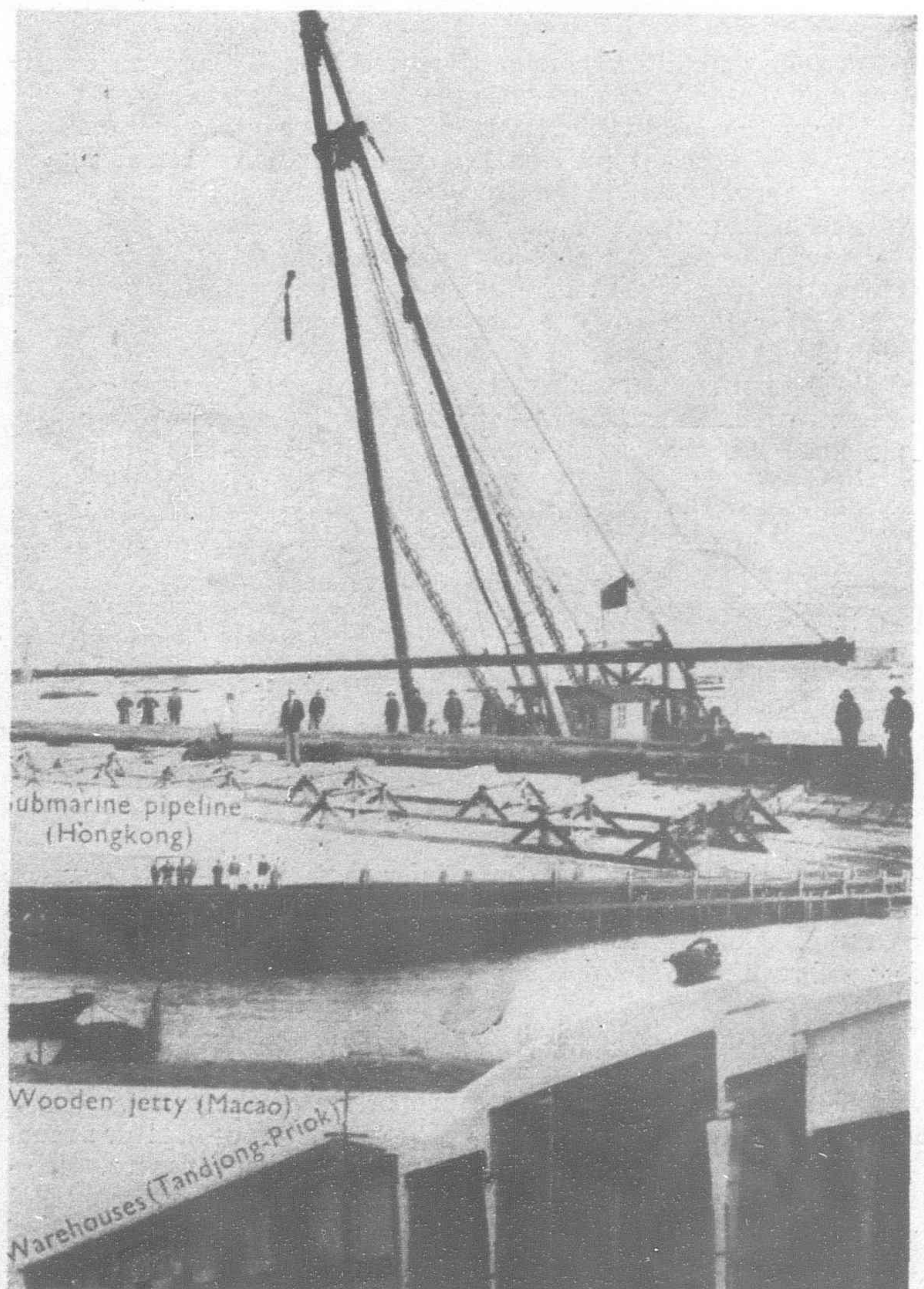
TABLE II.—VESSELS ENTERED FROM AND CLEARED FOR ABROAD IN CHINA: BY PORTS (EXCLUDING HONGKONG)

Port	Total 1935	
	January-December No.	Tons
Aigun	No longer under the control of the Chinese Maritime Customs Service	
Harbin		
Hunchun		
Autung		
Dairen		
Newchwang		
Chinwangtao	454	882,946
Tientsin	1,430	2,169,026
Lungkow	1,507	293,139
Chefoo	1,625	1,020,334
Weihaiwei	1,203	517,304
Tsingtao (Kiaochow)	1,435	3,601,419
Yochow	2	10,416
Hankow	330	890,520

Port	Total 1935	
	January-December No.	Tons.
Kiukiang	5	19,819
Wuhu	235	449,418
Nanking	68	198,403
Chinkiang	26	81,002
Shanghai	3,678	16,836,787
Ningpo	77	122,474
Wenchow	17	3,671
Santuaio	17	11,609
Foochow	276	347,052
Amoy	955	2,354,139
Swatow	2,861	4,170,585
Canton	16,530	6,658,320
Kowloon	21,034	2,007,592
Lappa	8,732	984,853
Kongmoon	3,763	1,373,559
Samshui	2,530	891,337
Wuchow	2,536	919,380
Kiungchow	852	947,110
Pakhoi	320	341,567
Lungchow	613	1,790
Total, Jan.-Dec. 1935	73,111	48,105,571

Waterways of China

The bulk of the cargo that moves inland in China is carried on the waterways. There are not only the many navigable rivers but an enormous mileage of canals and navigable lakes. In recent years, especially during the last five years, great developments



Harbor Works in the Far East as carried out by the Netherlands Harbor Works Co. The picture shows some of these projects at various ports

in road construction in China have taken place, but in many cases the roads are tracks not yet suitable for lorry traffic. In any case, the total mileage of roads and railways in China is small, as compared with that of the navigable waterways. As was recently stated, "Wherever the Chinese have found a navigable river they have, by a sort of instinct derived from pre-historic times, endeavored to utilize it." In addition, they have constructed many canals, including the famous Grand Canal, along which goods are carried from Hangchow in Central China, to Peiping (formerly Peking) in the North, a distance of about 1,000 miles. The large lakes also assist the volume of cargo carried in China by water.

The three large river systems of China are shown on Map 3. A glance at that map will show the great importance of the huge area drained by the Yangtze and its tributaries. That explains the great proportion of the volume of imports and exports shown under the heading "Shanghai" in the annual returns of the Chinese Maritime Customs Service. Hongkong, being a "free port," does not figure in these returns.

The rise in the level of the water of China's rivers create unusual problems. At Hankow, in most years, the difference between highest and lowest water is about 100 feet. During the big floods in 1915 of the Canton River the water at Wuchow rose 82.3 feet above the lowest water level on record. At the highest stage the water passing Wuchow was 2,100,000 cubic feet per second. The average rise is 61 feet above lowest water mark. In 1924 in 24 hours there was a rise of 22 feet.

On a stretch of coast 60 miles in length in South China, four rivers debouch into the sea discharging, in the rainy season, about 2,800,000 cubic feet of water per second and an enormous volume of silt, affecting the harbors of Hongkong and Macao and the river beds; improving by artificial works the flow in a few channels would increase the velocity and lower the river bottom by scouring.

On some of the waterways in China there are now European engineers with authority, and there are, each year, many improvements due to their efforts. The most important authority constituted by the Chinese Government in this connection is the Whangpoo Conservancy Board, which maintains a deep channel from Shanghai to the Pacific. It derives its income from a Conservancy Surtax on goods entering the port of Shanghai and on the sale of foreshore lands.

In 1905 the bar at the mouth of the river (Woosung outer bar) had a depth of only 15 feet at extraordinary low tides. That, and other defects, were becoming worse, so that, if regulation work on channels had not been undertaken, by this time Shanghai would have become inaccessible to large ships.

The river is now a reliable shipway, with a least navigable depth of 26 feet at extraordinary low water. As the neaptides rise at least six feet there is, each day in the year, a through high-water depth of at least 32 feet.

The Harbor Lights and Buoys

The first recorded light establishment on the Yangtze above Woosung—the anchorage near the mouth of the river—appears in 1861. This was a light vessel moored at Langshan crossing. In 1872 the first edition of the "List of Lights, Buoys and Beacons on the Coast and Rivers of China" appeared, when, in addition to the Langshan lightship there were 27 lighted aids, all between Woosung and Hankow.

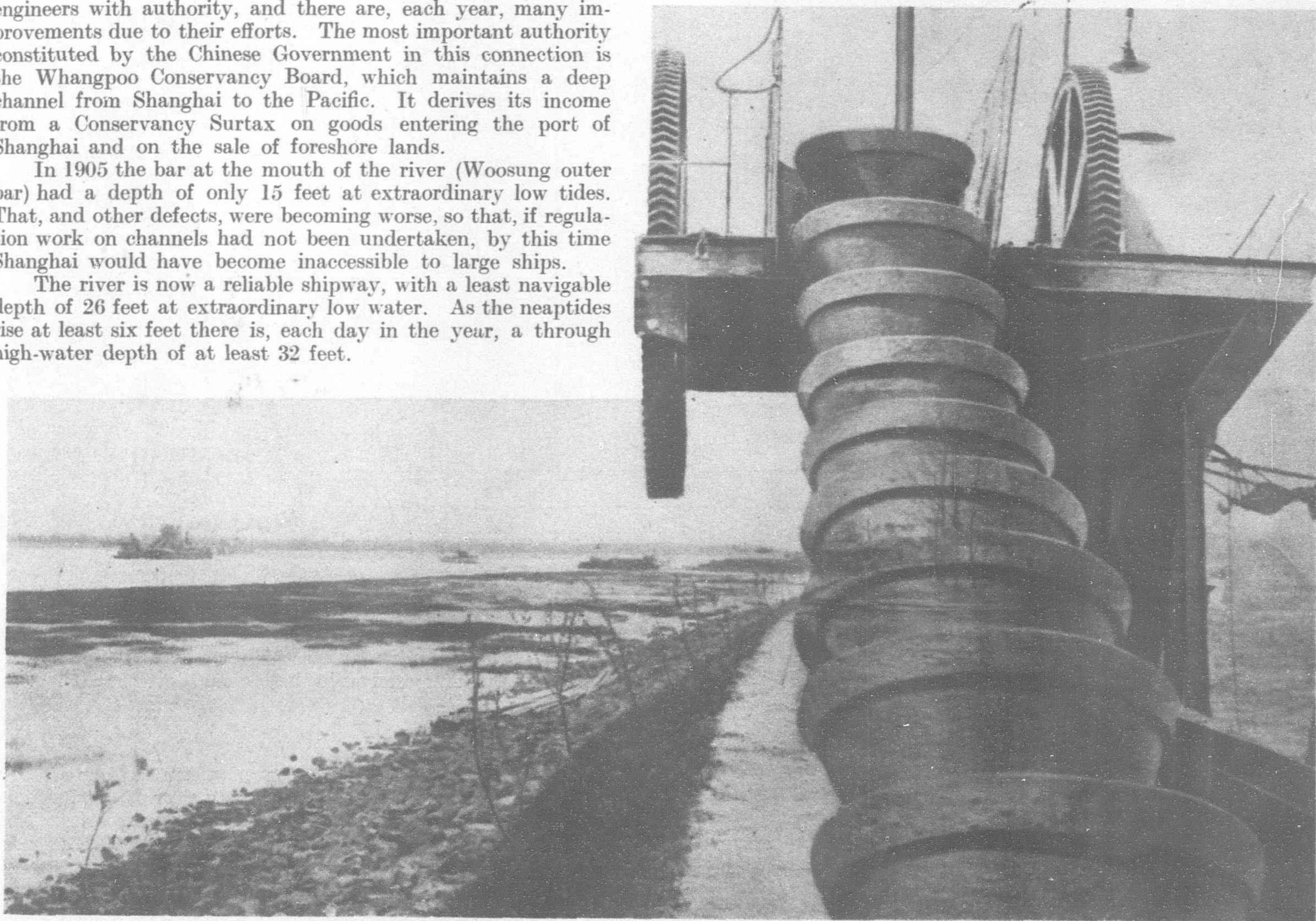
In December, 1935, there were fixed 12 new gas-lighted buoys, and ships can now proceed by day and by night from Shanghai to Hankow and vice versa.

The following table shows the progress made in lighting the lower Yangtze for night navigation.

LOWER YANGTZE LIGHTS FROM WOOSUNG TO HANKOW.

Year	Lightships and Beacons	Light Buoys	Total
1861	1	—	1
1870	22	—	22
1880	33	—	33
1890	35	—	35
1900	41	—	41
1910	64	1	65
1920	98	1	99
1930	133	2	135
1935	145	16	161

Terrible floods, owing to neglect of river conservancy measures, have frequently adversely affected China. In 1931, the Yangtze overflowed its banks and submerged an enormous area of land, causing terrible loss of life and property.



The first contract of the Netherlands Harbor Works Co. was with the Whangpoo Conservancy Board for dredging and reclaiming works to improve the approaches to Shanghai. Three bucket-dredgers, one pumping-dredger, six tugs and sixteen barges, besides auxiliary plant were employed from 1912 to 1916 in carrying out this contract. The dredgers were towed to Shanghai from Holland

Recently the Yellow River has again changed its course. In four months the waters flowed over the farms and villages of the large provinces of Shantung and Kiangsu, swallowing up rich agricultural land which sustained 500 people to the square mile. In four months there was formed a new river 400 English miles long, from one-half mile to 50 miles in width, entering the sea hundreds of miles south of its mouth. It is estimated that \$2,000 (silver) would have prevented this disaster. It will now cost \$5,000,000 to repair the breach, if it ever is stopped. That is typical of Chinese neglect of engineering problems.

The water transport on the rivers is a matter bound up with river conservancy and reclamation schemes, many of which would be highly profitable if properly financed and carried out by trained experts. It is a problem bound up with the prosperity and trade of China, for it seriously affects, not only transport but agricultural products in China.

And since about 70 per cent of the 400,000,000 people in China work on the land, the wealth they produce must affect foreign trade.

In 1933, the Whangpoo Conservancy Board employed seven foreigners, all experts, and 756 Chinese, including a few engineering graduates.

Further details of this remarkable organization, which demonstrates the tremendous economic advantages to China of the employment of foreign experts for technical problems, will be given later. Meantime, it must be emphasized that, but for the work carried out by the Board in recent years, Shanghai would have ceased to be a port of call for large ocean-going vessels. That would have resulted in the dwindling of Shanghai to a place of secondary importance instead of, as it is to-day, the premier port in China.

The Chinese Maritime Customs Service employs a number of technically-trained foreigners, and is also a remarkable example of the advantages of international co-operation in the endeavor

to increase trade. That efficient organization not only collects the revenue required to pay bond-holders their interest in Chinese loans, guaranteed by the Customs Service, but it maintains the lighthouses on the China Coast, has an efficient modern preventive branch, assists shipping in many ways, and helps in maintaining some of the waterways.

The Peril of Piracy

It has been stated that the movement of cargo on the inland waterways of China is expensive, as compared with freights on ocean-going steamers. It is said to cost nearly as much to move goods about 600 miles up the Yangtzekiang from Shanghai to Hankow as from Shanghai to Liverpool, a distance of about 10,000 miles. That is largely due to excessive taxation. And in many

cases piracy increases the risk. During a voyage in 1934 made by the writer on British vessels from Shanghai to Chungking, up the Yangtze (1,300 miles), armed guards and armored shields on the side of the ships protected us against rifle fire from the banks of the river. Many ships on the China Coast carry armed guards.

A great impediment to trade on the waterways is the fact that officials in the various river ports impose local taxation, unauthorized by the Central Government of China. That is, of course, in addition to the Customs dues paid at the ports of entry to China.

We were told that a motor-car selling in England at £300 could not be sold under £2,000 at Chungking, mainly because of the taxes that had to be paid on various stretches of the inland waterways.

At present the Central Government of China, in the Capital,

Nanking, can only enforce its authority in about five out of the eighteen provinces of China; it now has no authority in the huge areas of Manchuria, Mongolia, etc., which were ruled for centuries by Chinese dynasties. The political difficulties, both internal and foreign, in China since the revolution in 1912, which aimed to establish a Republic, has had a disintegrating effect on Chinese Central Government authority.

Yet, in spite of those facts, shipping increases each year in volume on the China Coast. And to improve port facilities is the very definite policy, not only of the Central Government of China, but of Provincial Governments that have "home rule" to such an extent that they take very little notice of the Central Government. Progress of a very real nature in all engineering work is being made in China to-day, in spite of all the political troubles. Foremost in the minds of all foreign educated Chinese is the desire to improve the com-

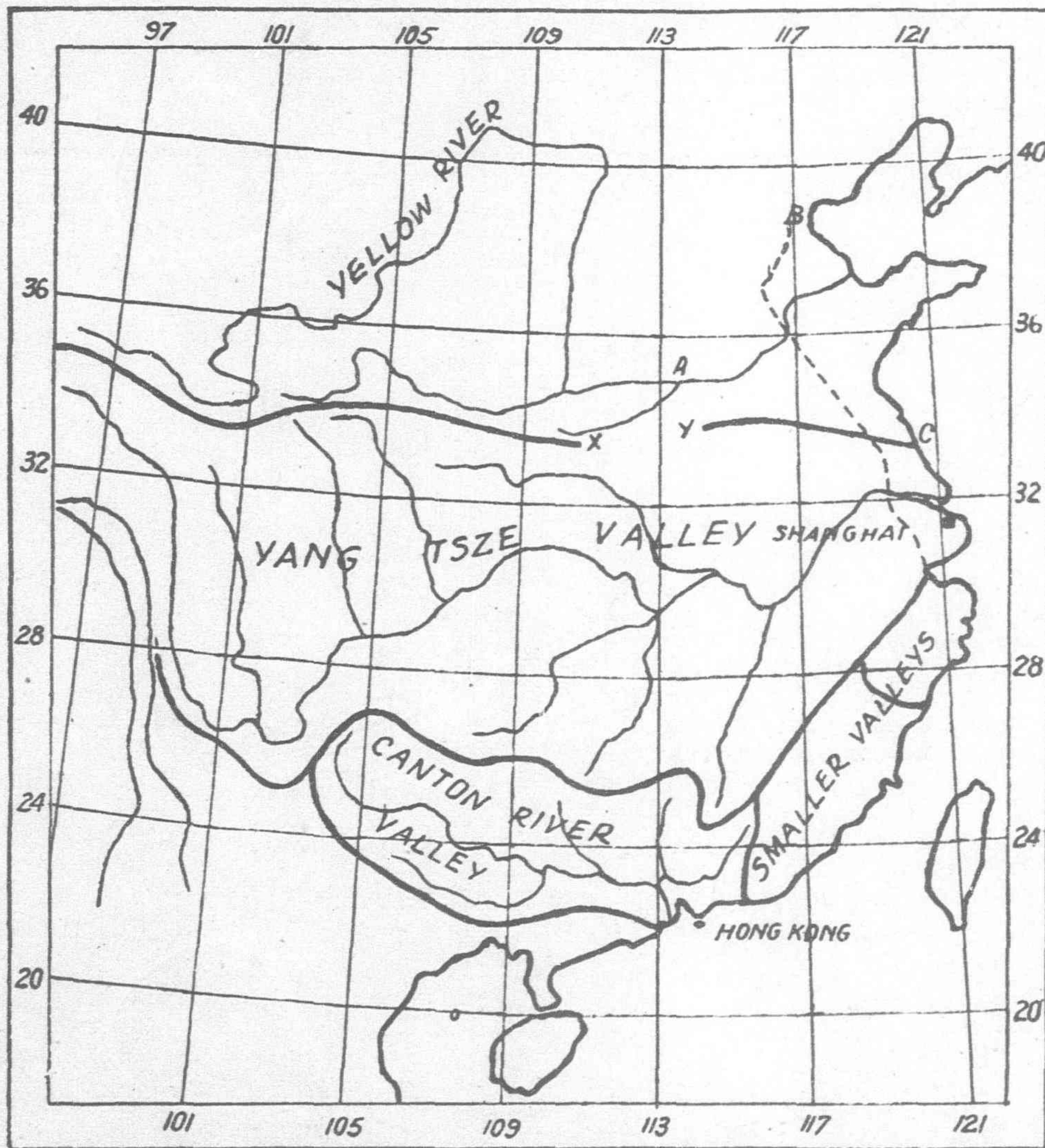
munications of the country. These foreign educated Chinese now hold many of the key positions in the various Governments.

Wasted Effort in China

Typical of their outlook is a recent statement by one of them that whereas 20 per cent of China's man-power is employed in transport, five per cent is sufficient in Western countries. And yet the actual transport in China is relatively meagre, of poor quality and expensive.

The above general outline will enable the reader to realize that there has been, in recent years, growth and great activity in the ports on the Western Coast of the Pacific. And it is fully realized in China that commerce will increase and that better port facilities

(Continued on page 24)



Map 3—Showing the three great river systems of China, viz.: Yellow River, Yangtze and Canton River. The thick lines separate the drainage areas of the rivers. Periodical burstings of Yellow River southwards between X and Y. Ancient bed of Yellow River from A to B. Original mouth at C. The dotted line shows the Grand Canal

Germans to Build Chinese Railways

Major Portion of New Loan of Forty Million to be Devoted to Building Chuchow-Kweiyang Line of 1,000 Kilometers

By BRUNO KROKER, Ph.D.

IMPORTANT and significant events in New China's reconstruction often have the fate of inadequate recognition at the time of their factual conception, or suffer brief and often distorted comments in both the Chinese and foreign press.

Without attempting here to find fault in this respect in any particular sphere, it is at the same time necessary to fill the so-far unfilled gap and call attention to an event of great importance: the conclusion in December last of a \$40,000,000 railway loan between the Chinese Ministry of Railways, upon behalf of the Chinese Government, and a number of well established German firms, which include Messrs. Otto Wolff Company, Ferrostahl, Friedrich Krupp, and the Stahl-Union-Export Company.

The conclusion of this contract is significant from two main standpoints. It means a welcome re-entry on the basis of active participation of German heavy industry firms in China's reconstruction, a most welcome sign for all concerned. And it also means that new and much-needed links in China's railway system will no longer remain on paper, as they have for many years; but that they are being translated into an actuality to-day. And above all, the agreement is a tangible demonstration that in these days of stress, overwhelming obstacles to progress can be overcome by co-operation between two countries, both working for sincere mutual benefit.

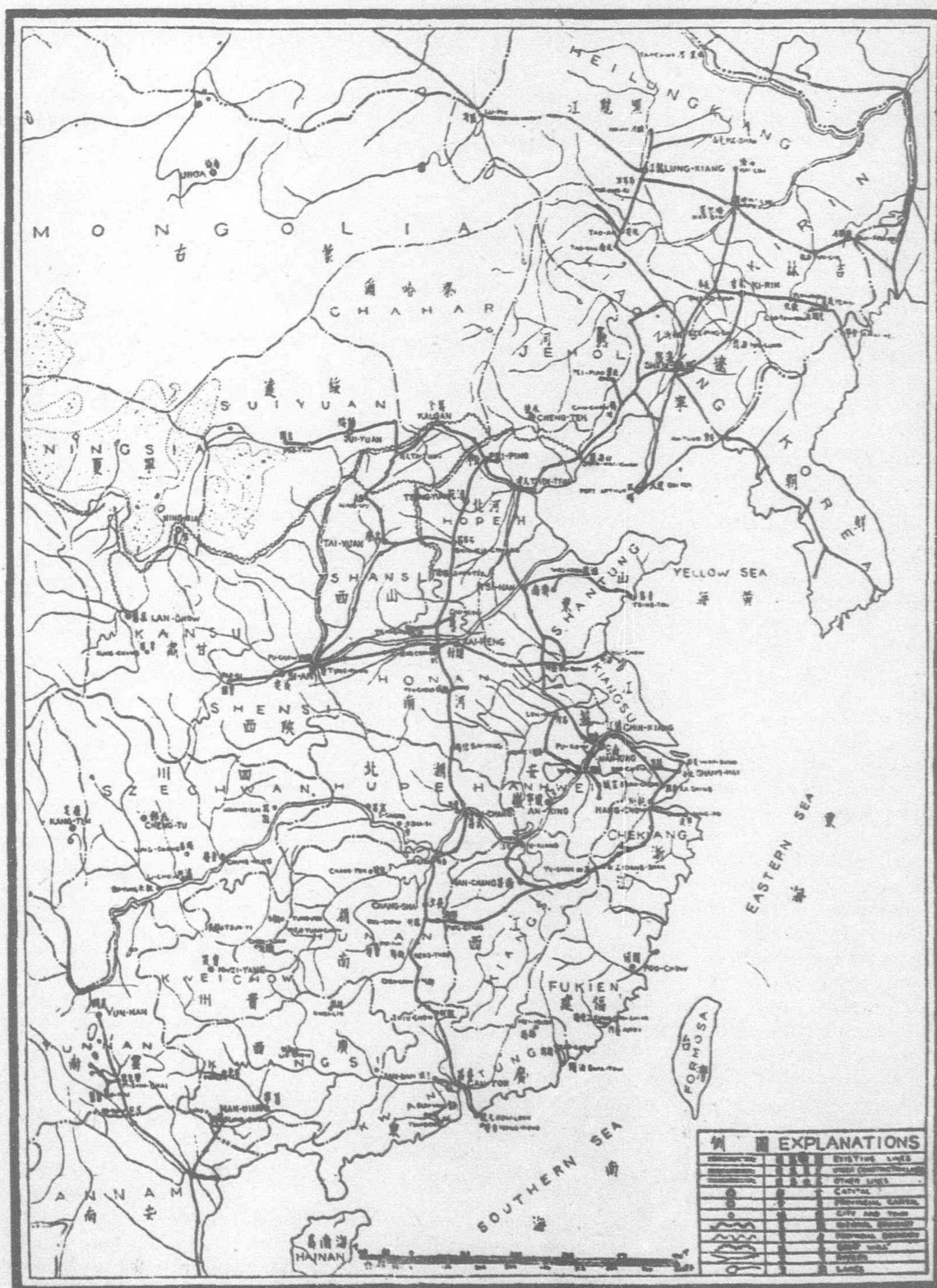
The Major Project

The major portion of the loan, a sum of \$30,000,000, is being used for the construction and equipment of a new and important railroad connecting Chuchow, in Hunan Province, with Kweiyang, capital of Kweichow Province, a distance of about 1,000 kilometers. It will be the Western extension of the Hangchow-Kweiyang line, certainly an important link. It will be remembered that the Hangchow-Yushan section of this line was completed about two years ago. The Yushan-Nanchang section, which involved many technical difficulties, including a long span over the Kan River at Liangchiafu, was completed a year ago this month. On the day that the Yushan-Nanchang section was formally opened, work started immediately at Liangchiafu on the extension of the line from Nanchang to Pinghsiang and Chuchow, the latter being an important junction on the recently completed Canton-Hankow Railway.

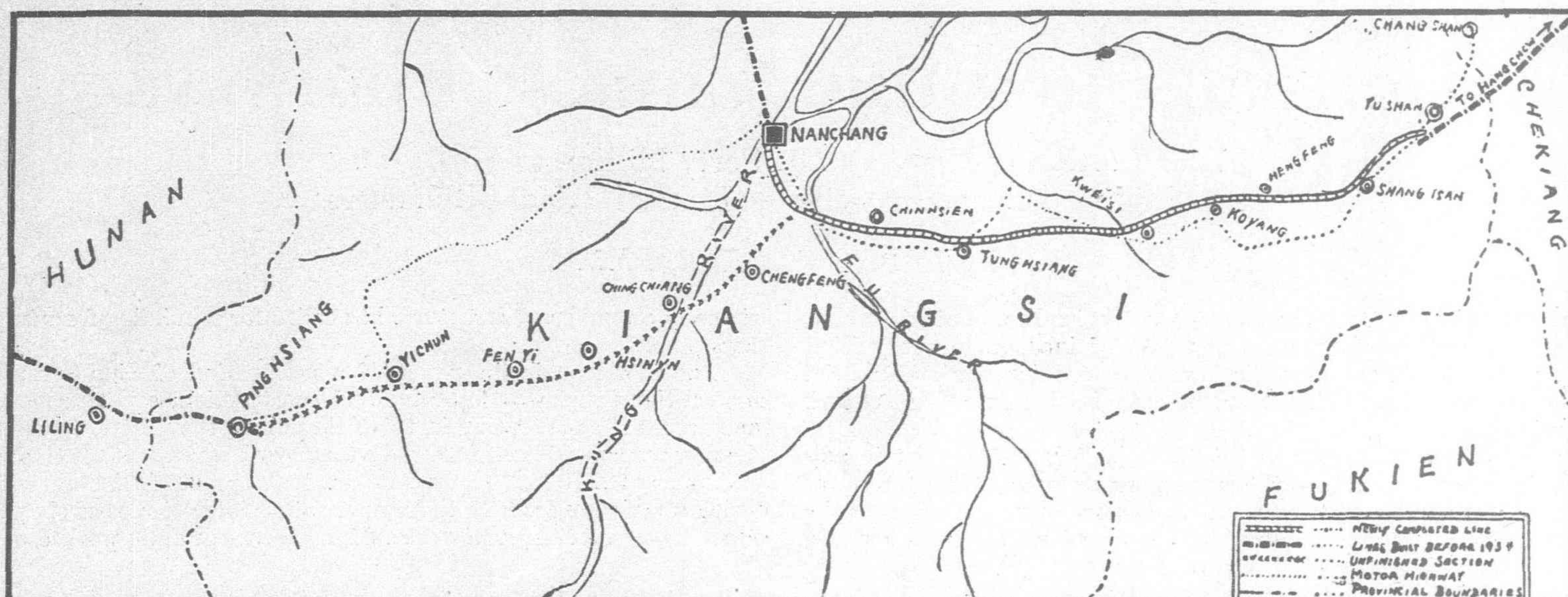
The remaining portion of the loan, a sum of \$10,000,000, will go toward the much needed reconstruction of the bridge of the Peiping-Hankow Railway across the Yellow River. This bridge,

originally a temporary structure, has called for rebuilding for many years past.

The new loan is the result of a new period of Sino-German co-operation in railway financing and construction, and represents the successful co-operation in this field during the past few years. The new agreement itself followed a temporary agreement concluded on January 22, 1936. The credits are to be repaid in instalments during a period of from 10 to 12 years, at an interest rate of six per cent. The financing, it may be said, has been carefully worked out



Map of the Railways of China



Map of the Yushan-Nanchang Railway

and is, as can be noted, on the conservative side. This happy aspect will insure its payment, and it is expected that the credits will be easily liquidated before the scheduled time.

Opens New Era

While, as mentioned, the loan marks the active re-entry of German heavy industries in China's reconstruction, it follows a comparatively brief but successful new period of Sino-German economic co-operation. This co-operation has accounted for the construction of more than 1,000 kilometers of railways in China, which include the following lines:

1.—HANGCHOW-YUSHAN.—This line is 360 kilometers long and was completed about two years ago. Rails were supplied by the Stahl-Union, rolling stock by the German firm of Orenstein and Koppel.

2.—YUSHAN-NANCHANG.—This line, 300 kilometers long, was contracted for at the end of 1934. Communist troubles delayed its completion to January, 1936, when it was opened to traffic. Light rails, used on this line, are now being replaced by regular weight rails. These two lines form the Chekiang-Kiangsi Railway. They will be

linked directly to Hangchow upon the completion in the near future of the Chientang River Bridge.

3.—NANCHANG (Liangchiaifu) PINGHSIANG.—This line, 360 kilometers apart, is expected to be completed within six months. Construction started in January, 1936.

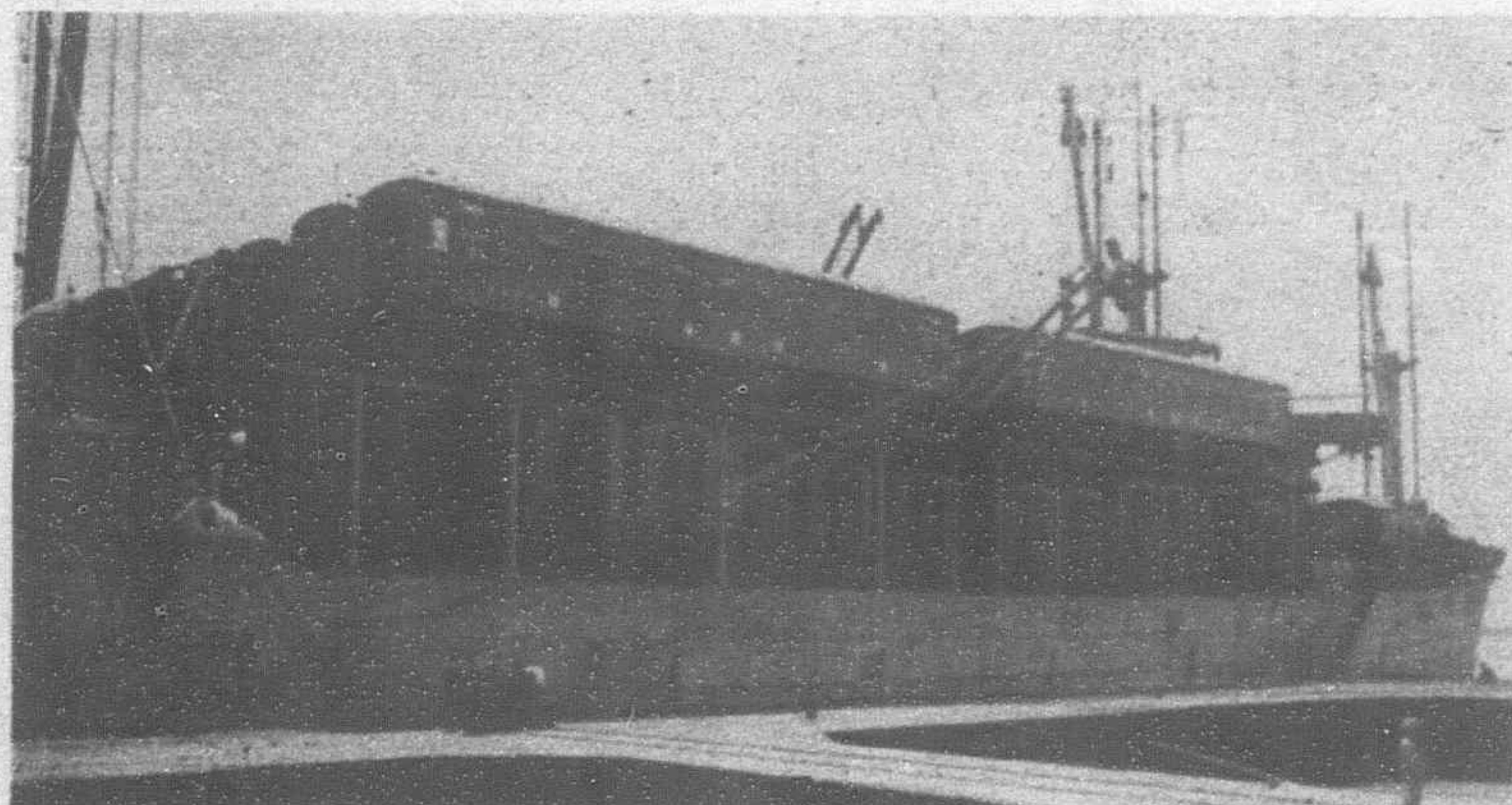
German assistance in the building of these lines did not only include financing and the supply of materials, but technical assistance, when necessary. German materials were used almost exclusively, including rails, rail equipment, switches, shunts, bridge-construction-material, workshop equipment, and complete rolling stock and supplies. Wherever possible, Chinese material was used, such as in the construction of stations.

It must be remarked that basically, Chinese engineers were responsible for the survey and essential design. Naturally, German engineers assisted materially at many points; but Chinese with just pride point to their rôle in the engineering of the line (as the writer has

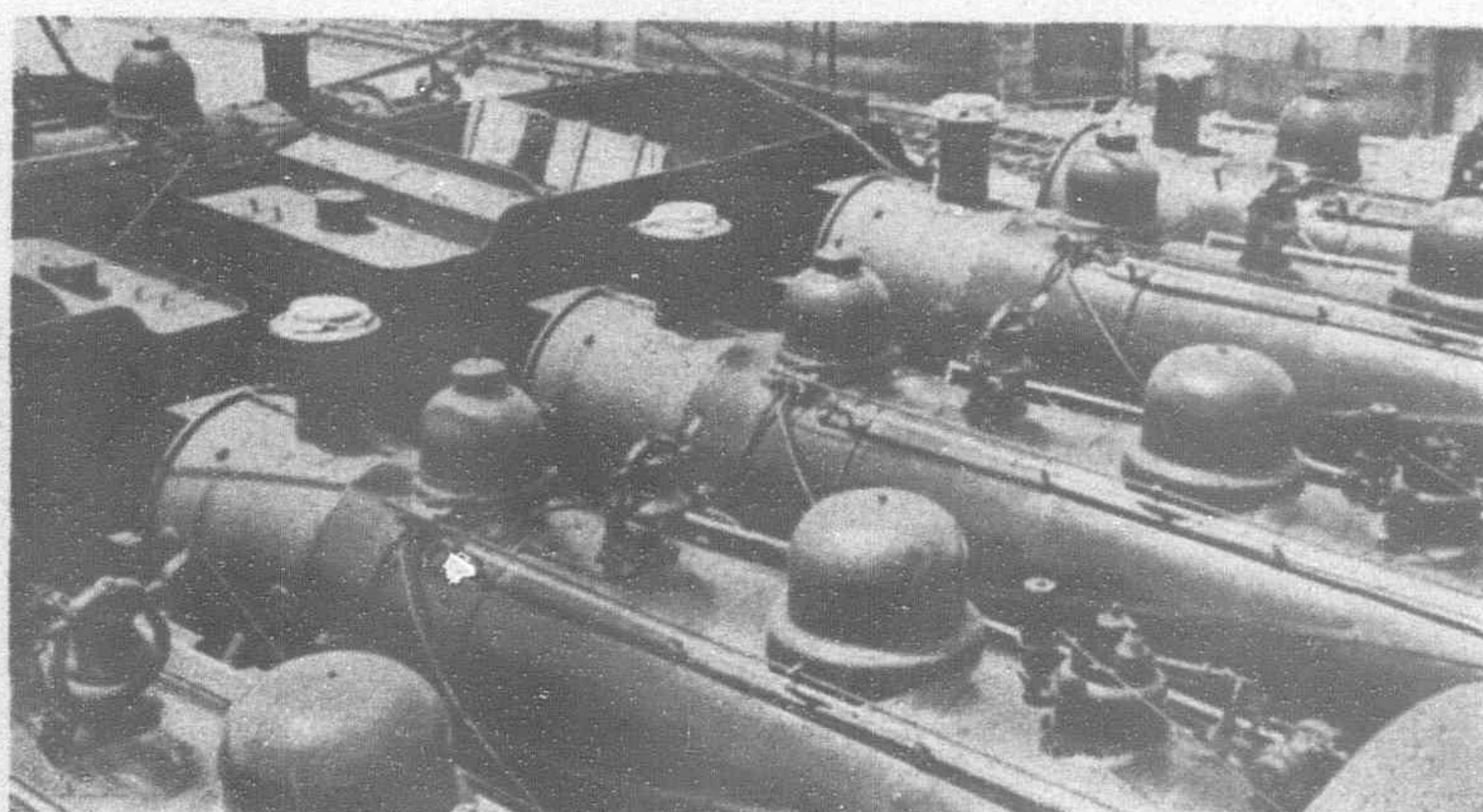
travelled on the Hangchow-Nanchang section, he can say that utmost credit must be paid to the Chinese engineers). Such details as stations, station approaches, station locations, cuts and fills,



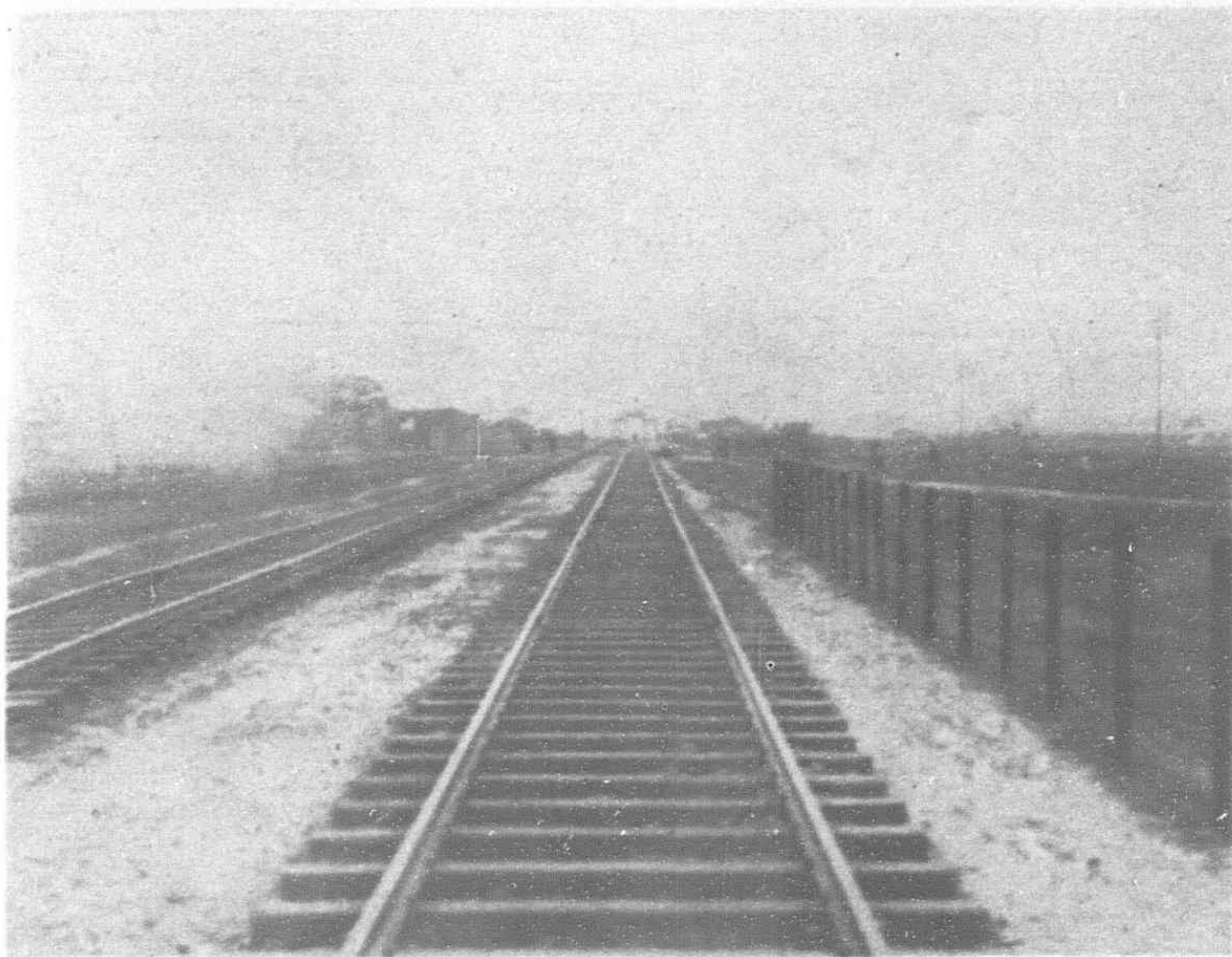
The Burlington Hotel, in Nanchang, worthy of its name as "The Cathay Hotel of Nanchang." It is modern in every respect, boasts private baths and a telephone in every room



New coaches for the Lunghai Railway, made in Belgium, being unloaded at Shanghai



Locomotives for the Canton-Hankow Railway, made in England, being unloaded at Shanghai



A typical view along the Yushan-Nanchang Section of the Chekiang-Kiangsi Railway

survey work, and other particulars have been carried out with commendable results, especially in view of the somewhat restricted finances in the building of certain auxiliary structures.

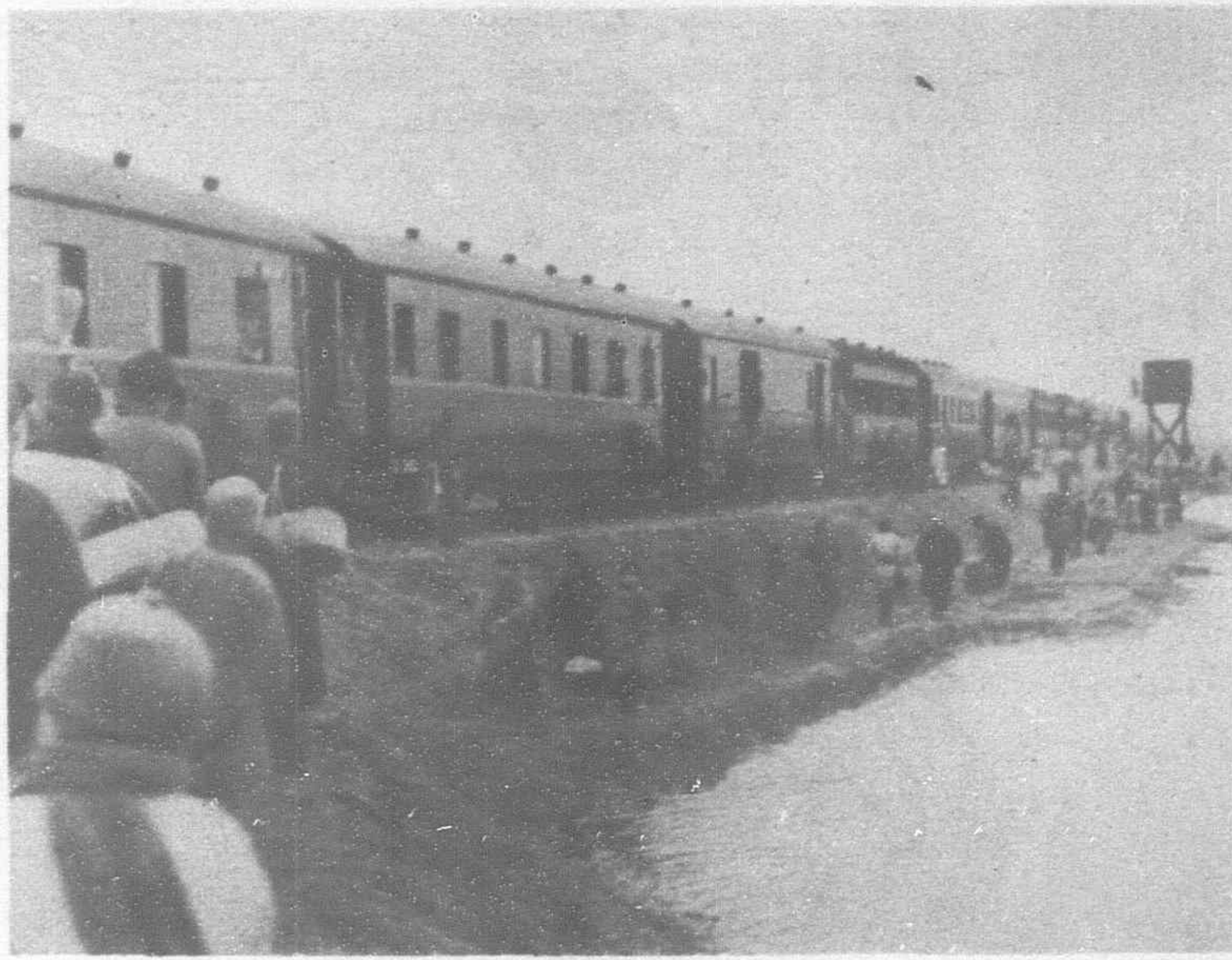
Is a Big Job

The 1,000 kilometer Chuchow-Kweiyang section will take about three years to complete, and will bring the total length of Chinese railway lines built and equipped with German materials to 2,000 kilometers. Even a few years ago, such a line as the Hangchow-Kweiyang project would be considered a dream. To-day, it is already 50 per cent realized. Three years from now it will be completed. The distance will correspond to two lines from Berlin to Paris. Through territory whose rich resources have been practically isolated, the line will pass through the provinces of Chekiang, Kiangsi, Hunan and Kweichow. A link to Yunnan is already under consideration, and its realization in the future cannot be questioned.

Including the amount allocated for the Tsinpu line, the Hangchow-Kweiyang line will account for a total of \$70,000,000 in German credits advanced for railway building. But it should be kept in mind that this sum does not represent the total outlay for the lines. Chinese labor was, and is being utilized on the line, while, as mentioned, Chinese materials were used as far as possible. The local construction expenses amount to a considerable figure, and were financed through Chinese banks.



Another typical view along the Yushan-Nanchang Section of the Chekiang-Kiangsi Line



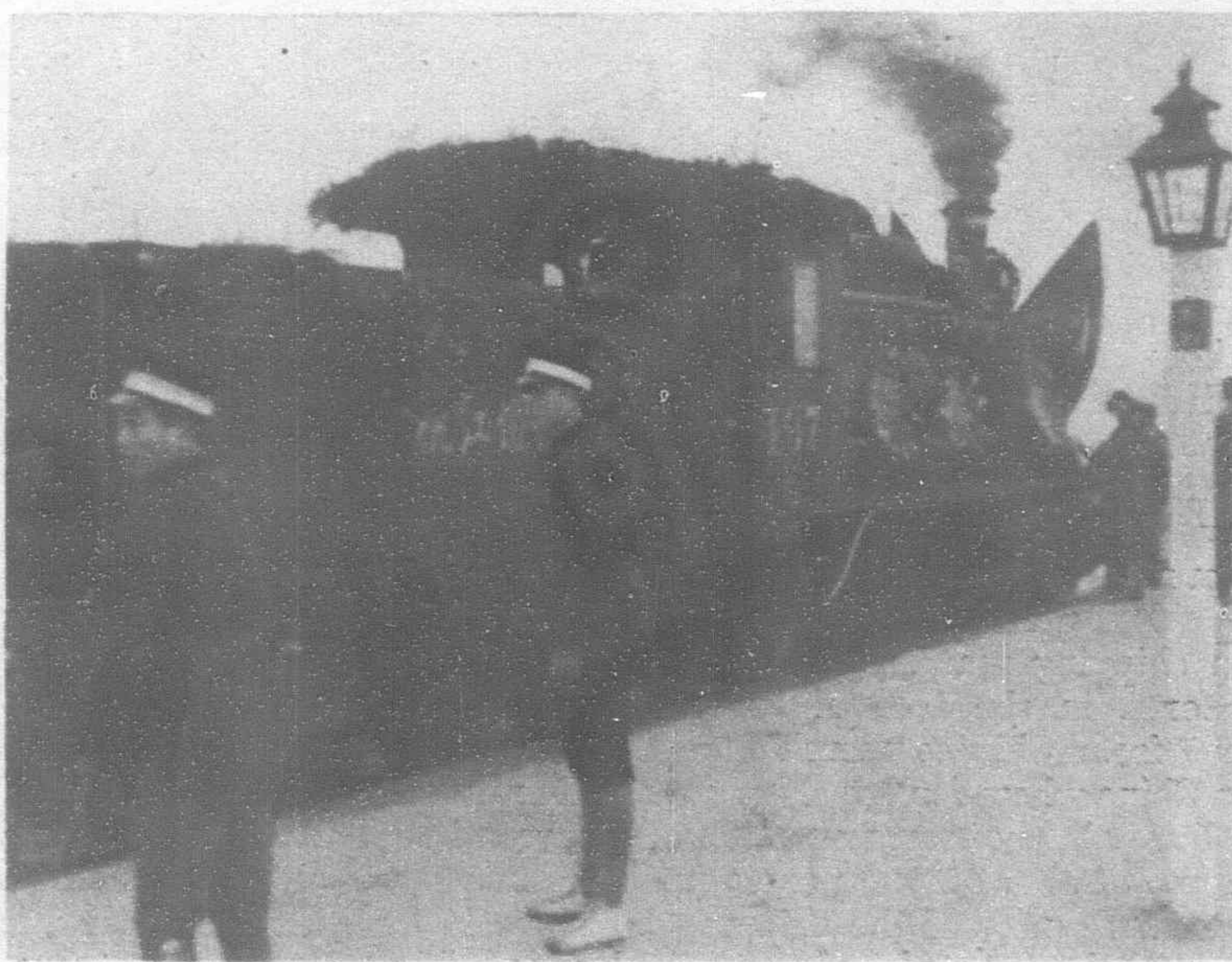
Excited villagers greet the first passenger train on the Yushan-Nanchang Section of the Chekiang-Kiangsi Railway

It is not really necessary here to stress the importance of the construction of this new rail link. The crying need for new lines of communication in China is already too well known to draw further comment. However, a few words on this particular line are in place. Perhaps in some contrast to a few other lines, the Hangchow-Kweiyang line will run through rich territory which, as yet, is practically untapped. The reason for their resources remaining unexploited is simply because of lack of transportation. The gold is there; but no way to transport it once it is mined.

The railroad answers this problem. In the case of the already-completed Hangchow-Nanchang section of the Hangchow-Kweiyang line, a new economic lease has been given to the war-torn province of Kiangsi. New mines have been opened. A basic flow of commodities from the province, practically impossible in the past, has started and has already assumed a proportion not predicted. Not only serving as an outlet for existing products and industrial goods, it has served as the impetus to the opening of new industries.

Significant Effects

When it is realized that within a relatively short time, one may board a train in Shanghai and travel completely by rail to Kweiyang, a distance of more than 2,000 kilometers, the importance of the new line can best be grasped. One of China's most remote provinces will have been connected by rail to China's principal port.



The engine which pulled the first regular passenger train to Nanchang from Hangchow, when the Yushan-Nanchang Section of the Chekiang-Kiangsi Railway was completed



When ground was broken in January, 1936, at Liangchiafu for the extension of the Chekiang-Kiangsi Railway from Nanchang to Pinghsiang. Mr. Tseng Yang-fu, then Vice-Minister of Railways, now Mayor of Canton, is in the center. Next to him Mr. Paul Meissner (Otto Wolff) and Mr. T. H. Ho from the Bank of China



German engineers and firm representatives who supplied the materials for the Chekiang-Kiangsi Railway. In the background from left to right : Mr. Paul Huldermann, Editor of the "Ostasiatischer Lloyd," German newspaper in Shanghai and Mr. Egbert Hildenhagen (Otto Wolff). In front from left to right : Dr. Paul Beek (Otto Wolff) and Mr. M. Fischer, councillor of the German Embassy; Mr. Paul Meissner (Otto Wolff)

Railways work both ways. Not only does a new line mean that Chinese products and resources can be exploited. It also means that new and important markets are opened up for both Chinese manufactured industrial products and for imported products. In the past these products could not reach the greatest percentage of the populace at all, or could not be utilized if they did reach their final destinations because of the prohibitive costs necessitated by costly and inefficient transport methods.

While these comments are intended to reflect mainly on the Hangchow-Kweiyang Railway, and the German credits making it possible, it is more than appropriate here to mention briefly the important and progressive rôle being played by Mr. Chang Kia-ngau, the Minister of Railways, who, in his term of one year in Office, has been energetically active in seeing that paper plans do not remain on paper. Suffice it to say that in this present period of internal and external difficulty, the Minister and his staff have quietly and unostentatiously labored, the results of which—new railways that are in operation and old lines which have been

brought to a new peak of efficiency—speak for themselves.

Equally significant and important is the increasing part played by Sino-German co-operation in the development of railways and communications. The successful conclusion of the credit agreement serves to confirm a successful, what may be termed, experimental period of co-operation. A firm basis for this co-operation has now been laid, and future potentialities are unlimited. This co-operation has mutually benefitted both nations. In dollars and cents, it is proved by the gradually rising value of German imports in China, a large portion of which is accounted for by railway equipment and rolling stock, and the correspondingly increasing value of Chinese exports to Germany.

The Sino-German credit agreement for the Hangchow-Kweiyang Railway not only marks a new step in the development of Chinese communications, it also represents a new and important stage in Sino-German co-operation, friendship, and commerce which is playing an ever more significant rôle in the economics of the Far East.

FAR EASTERN PORTS : THEIR FUTURE DEVELOPMENTS

(Continued from page 20)

will become available as the years go by. Meantime, Britons may well be proud of the leading position of the British in the general development of trade in the Far East.

The two most important ports on the China Coast are Hongkong and Shanghai. Rivals, to some extent, they both clear, each year, about the same volume of shipping. Hongkong has many natural advantages, including a deep natural harbor denied to Shanghai, but the latter has an enormous hinterland, productive with alluvial soil and teeming millions of industrious workers, and criss-crossed by many thousands of miles of useful waterways. Both can flourish.

For more than a century the British have been the pioneers in shipping matters in China. From 1841 onwards it was their efforts, in the face of great opposition from Chinese officials—not from Chinese merchants—that Treaty Ports, the only ports in China where foreign ships may load or unload cargo, were created. Above all, the transformation of a barren island Hongkong, from a home of about 5,000 people (mostly pirates) to a huge port and a modern center of the shipping industry, in less than a century, is one of the triumphs of the British race. The effect of that transformation upon China cannot be over-estimated, for Hongkong has been an object lesson, adjacent to China.

Nor can history reveal any example, comparable to that of Japan, in the almost sudden creation of huge mercantile shipping interests and a powerful Imperial Navy. In almost every port of the world, and on almost every sea, the Rising Sun on the flag of Dai Nippon is to be seen to-day, whereas there was practically no foreign intercourse with Japanese sixty years ago. And we may take pride in the fact that, in maritime matters, the Japanese from the beginning of their modernizing policy, sought out and accepted Great Britain and her marine work as a pattern. All of the original professors, in such technical subjects as engineering, naval architecture, etc., in Japan, went out from Britain to Japanese Universities. It is upon the foundations, well and truly laid by those pioneers, that the "Britain of the Far East" has built up its great mercantile marine and has developed its modernized ports, as well as the industries which have brought Japan vividly into the world picture.

For those reasons every Britisher must be interested in the maritime progress of the Far East. A beginning has been made, but the future holds unlimited possibilities. It is therefore imperative for the British nation, dependent on foreign trade for existence, to give great and thoughtful attention to maritime work in the Far East.

Shanghai's Jukong Wharf Nears Completion

WHEN the new \$7,000,000 wharf north of Chiu Creek below Point Island is completed, Shanghai will be able to boast of one of the finest docks in the world. Jukong Wharf, representing Greater Shanghai's most ambitious bid for a place among the world's best built harbors, and standing to-day in the final stages of completion after 16 months of large scale construction work, backed by the Central Bank of China as a private enterprise; but also as part of the plans for the development of Greater Shanghai, is not a scheme undertaken on the spur of the moment.

The world's greatest consulting engineers, as well as the Chinese Maritime Customs, have spent their time in preparing its construction. The building of it has been held up not only by financial reasons; but by natural and technical considerations which had to be thoroughly understood before the project could be undertaken.

Fifteen years ago, a committee of consulting engineers was invited here by the Customs, to make a report on the Jukong Wharf possibilities. The members of the committee which met in Shanghai on October 15, 1921, included Major-General W. M. Black, U.S. Army retired, formerly Chief of the Engineering Corps of the U.S. Army, nominated member for U.S.A. Dr. I. Hiroi, Adviser to the Japanese Government on Japanese ports, nominated for Japan (deceased 1929); Mr. P. G. Hornell, C.E., Consulting Harbor Engineer, nominated for Chinese General Chamber of Commerce; Sir Frederick Palmer, K.C.M.G., C.C.I.E., M.I.N.S.T.C.E., Consulting Engineer to the port of London, nominated for Great Britain (deceased 1934); Mr. P. J. Ott de Vries, nominated for Holland and Major A. W. H. von Heidenstamm, then Engineer-in-Chief, who was selected as Chairman.

This committee chose the present site of the Jukong Wharf

as the best in the Shanghai harbor and drew up a plan which was revised in 1932, when the League of Nations sent a committee of experts consisting of Messrs. L. Perrier, A. T. Coode and W. Sieveking on the invitation of the National Economical Council.

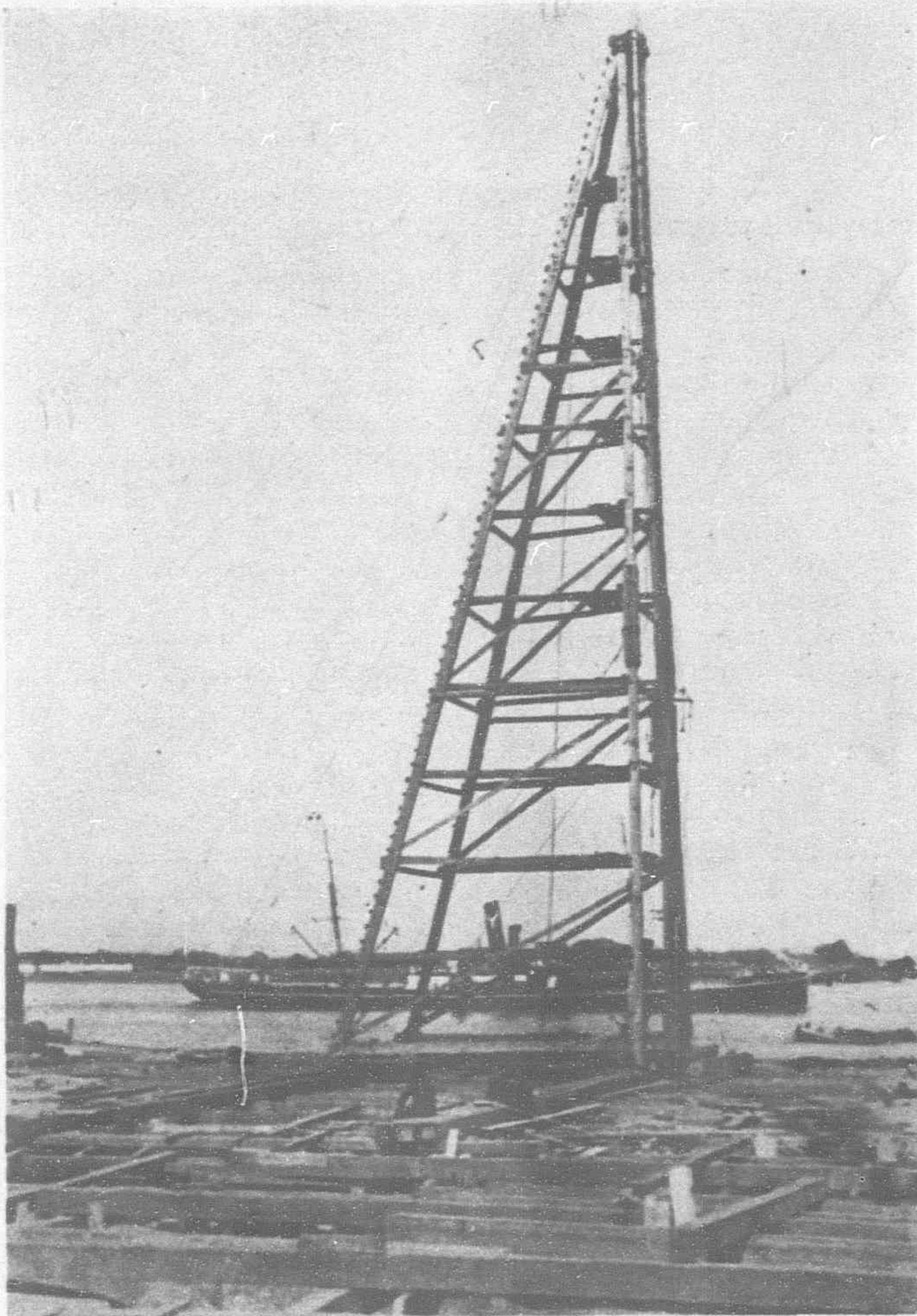
The 1932 League committee altered the plan of the first commission in but minor points, which suggested themselves as desirable in the light of the altered conditions since that date.

It was agreed that the Jukong site was the logical wharf for the

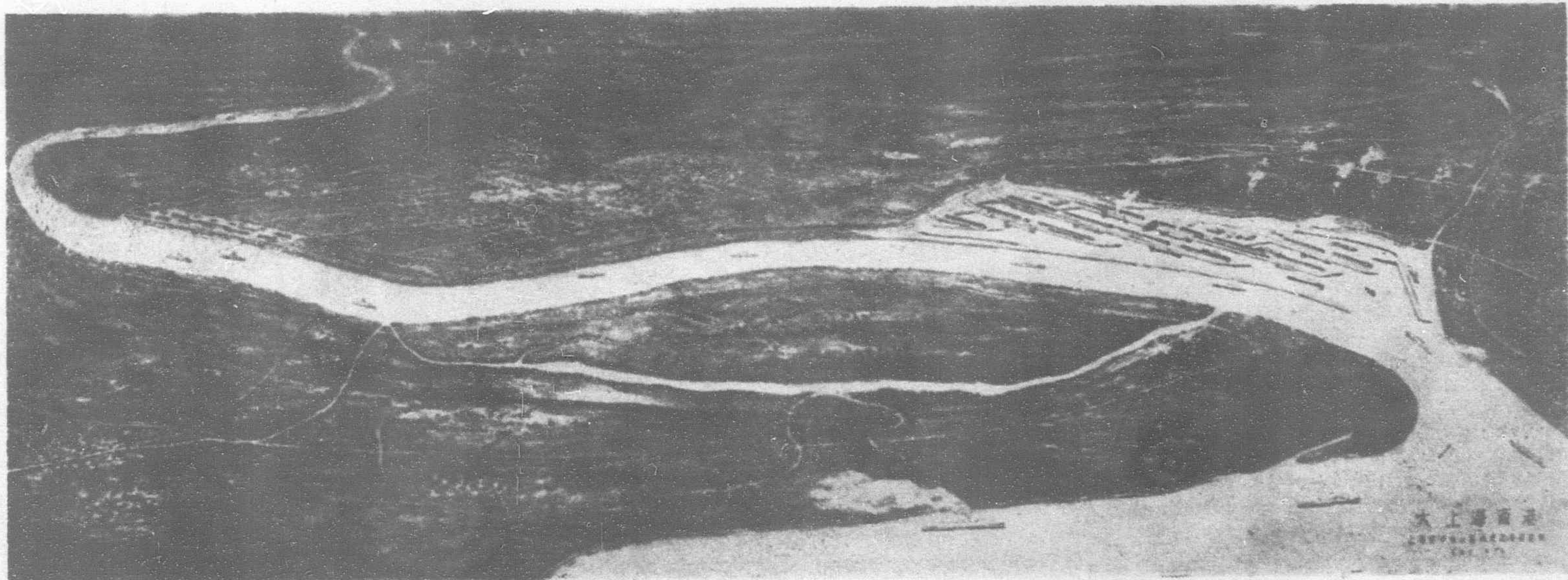
Civic Center, not only because it was nearest to the new Chinese municipality, but because it is the first fairly deep water spot down river from the new Shanghai Dock and Engineering Works, on the Shanghai side. The concave side of the river is always deeper than the convex. The Shanghai side, for the most part, is on the convex side and hence has had a constant fight to keep the water deep enough for ocean going vessels. The Pootung side, on the other hand, enjoys fairly deep water on its entire frontage. The short Jukong Wharf site immediately leads to more shallow water on the Shanghai side, as one goes downstream towards Woosung. It is considered the only place at present where ocean-going ships can come alongside the dock.

Considered as a passenger terminal, the distance of the Wharf from the Central district is but a minor consideration compared to the advantage of a quicker and easier crossing of the bar at Fairy Flats. With average traffic conditions and normal speed, a motor-car will make the distance from the corner of Nanking Road and the Bund to the Wharf in less than 20 minutes, and with the scheduled new and improved roads of the Civic Center development, this time may be considerably shortened.

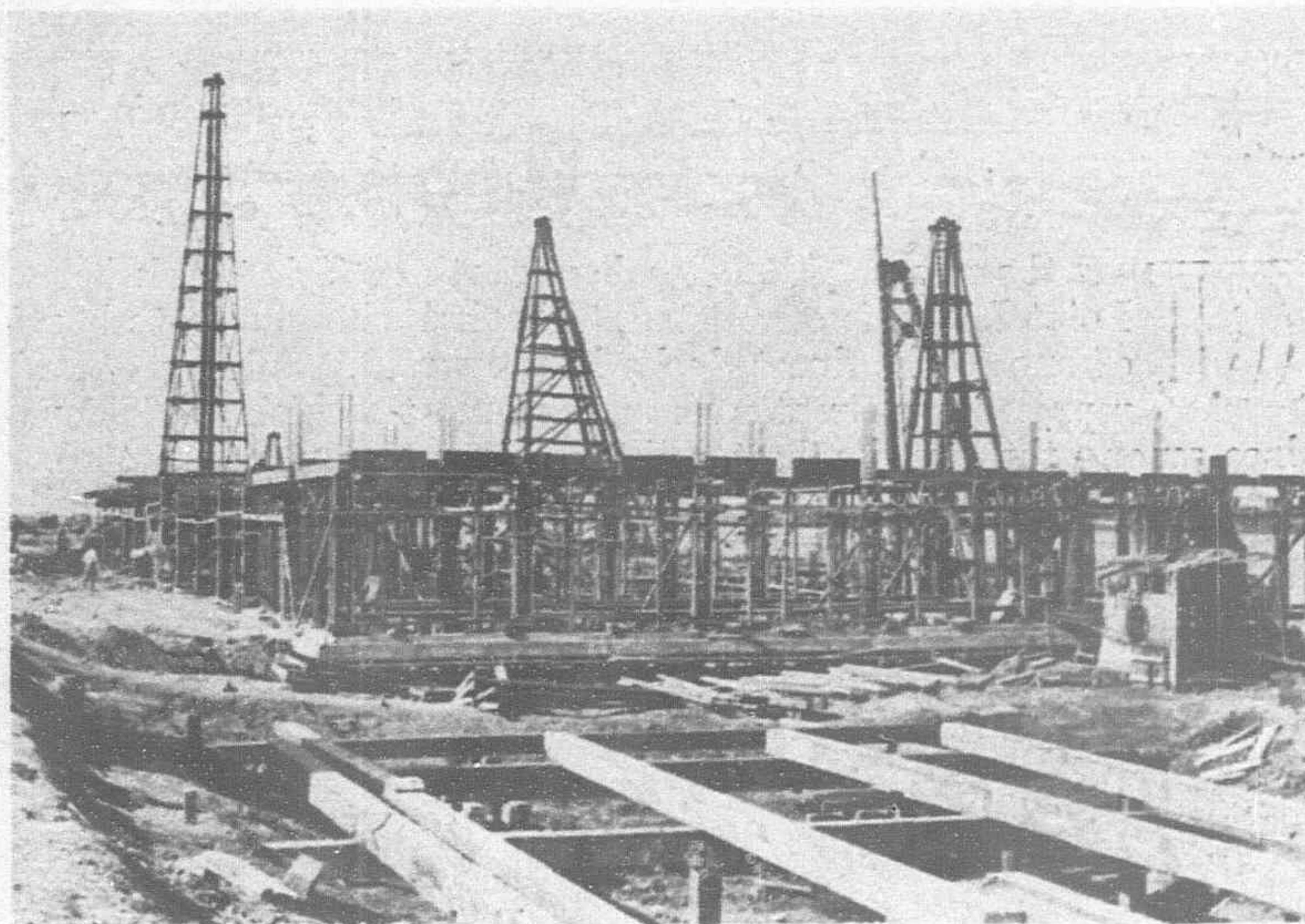
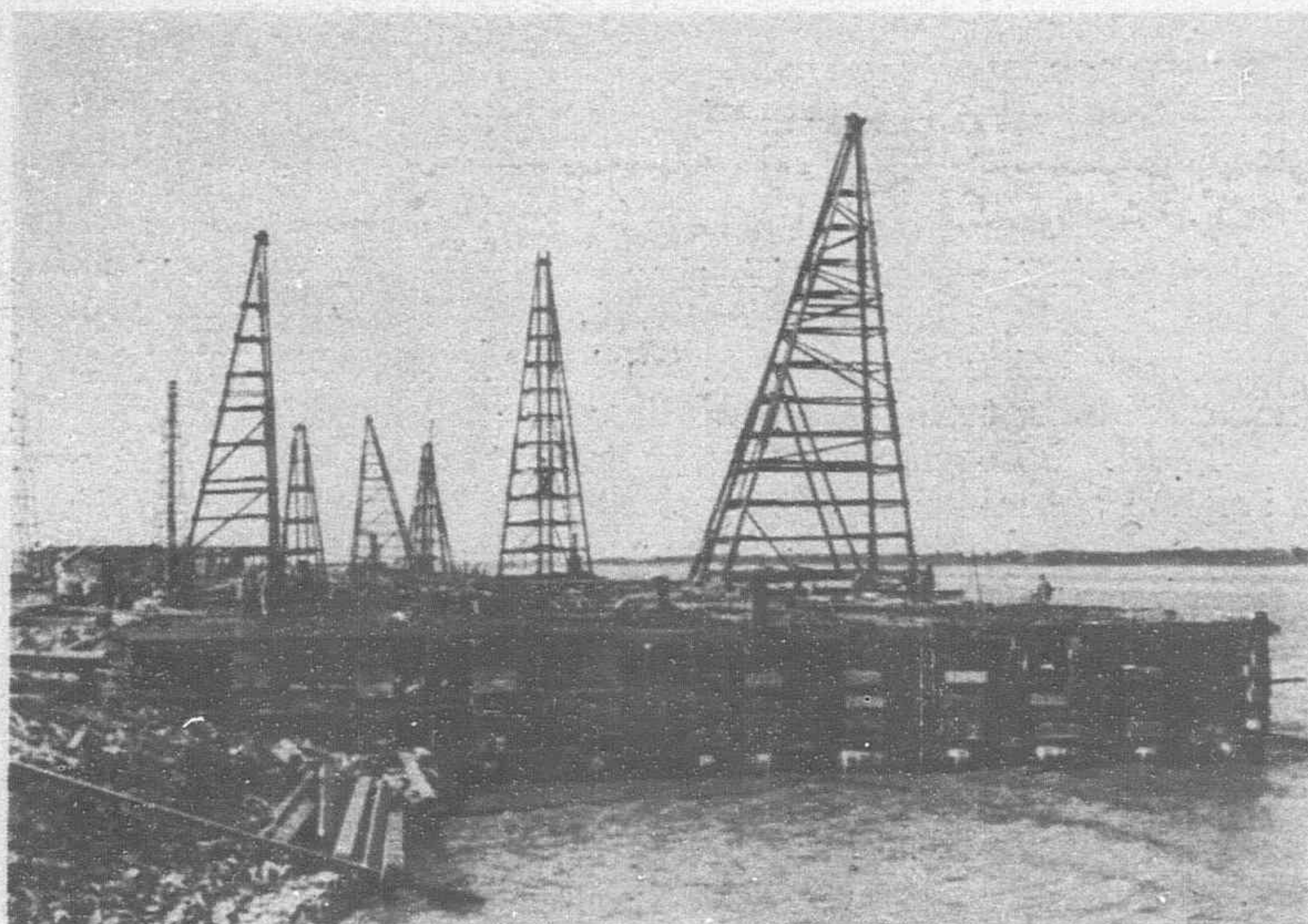
The wharf is built primarily for the accommodation of ocean-going vessels, and facilities for Customs'



One of the pile drivers used in sinking the 3,000 piles in course of preliminary work on Jukong Wharf



Where the Whangpoo enters the Yangtze, showing the location of the New Jukong Wharf



The two pictures above show the preliminary stages in the building of the Jukong Wharf when the piles were being sunk

examination of cargo and passengers' luggage are foreseen. The comfort of passengers and the rapidity of cargo movement are naturally very important considerations, and arrangements made that the one does not hinder the other.

After the League experts had given their advice, a "Jukong Wharf Construction Committee" was organized under instructions of Dr. H. H. Kung, Minister of Finance, and Governor of the Central Bank of China, composed of such prominent members as Mr. T. L. Soong, General Manager of the China Development Finance Corporation; Mr. Jian H. Chen and Mr. Chang Kia-ngau, Deputy Governors of the Central Bank of China; Mr. Churtong Yih and Mr. Hsu Kan, Managing Directors of the Central Bank of China; Dr. H. Chatley, Engineer-in-Chief of the Whangpoo Conservancy Board; Dr. O. S. Lieu, General Manager of the China Merchants' Steam Navigation Company. Mr. Henry H. Lin is Secretary of the Committee. Messrs. E. J. Muller, well-known Norwegian Civil Engineers, have been invited to serve as consulting engineers, and Messrs. Chang Sing & Co., experienced contractors in Shanghai, undertook the construction of the first stage of the wharf development.

An outlined sketch of the development up to now will give a clear idea how near the wharf construction is nearing to completion at the present time. A visitor may observe that the work has now reached that stage which permits recognition of the final shape of the development. Of the entire construction, about 95 per cent has already been completed. A total of 3,000 pieces of Douglas Fir piles, both 100 and 90 feet in length and 10 inches in tip diameter, necessary for the wharf and warehouses, have been driven, which alone took many months to complete.

The first step taken to bring this huge project to its present stage was the filling in of approximately 225 mow of low-lying fields,

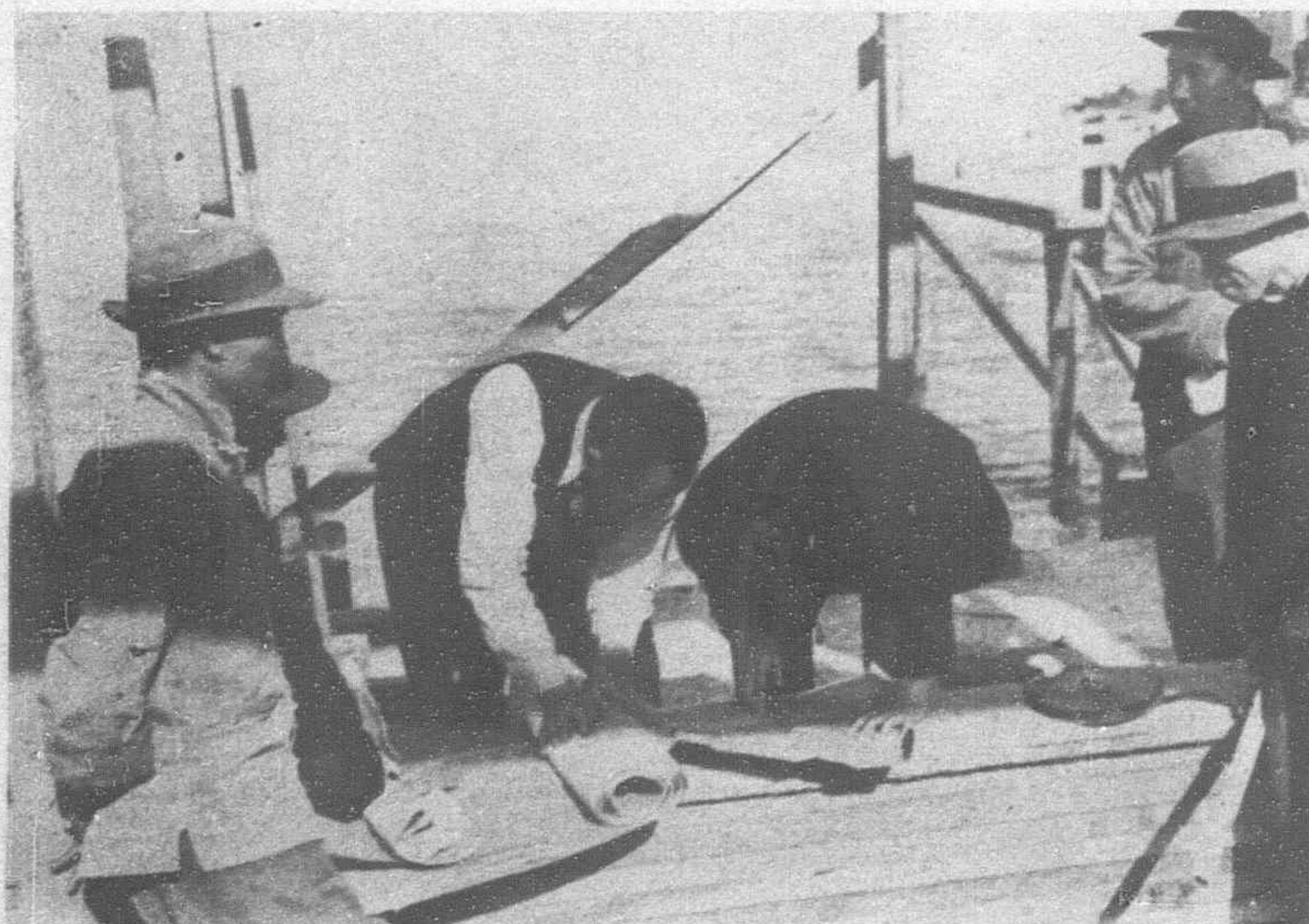
and the construction of two sections of reinforced concrete wharves, each 590 feet long, standing ready for service at this time. This length affords berthing facilities even to the biggest ships, including the *Empress of Britain*, which call at this port, and which are at present compelled to anchor outside Woosung.

They are constructed as composite wharves with a combination of reinforced concrete superstructure on wooden piles, which are cut somewhat below average waterlevel, so as to keep them sufficiently wet for immunity to any deterioration. The comparatively open construction allows a fairly free flow of water under and behind the wharf, minimizing the danger of any excessive silting. To gain easy access for lighters, when ships are berthed alongside, space has been left between the sections, so as to provide a reserve in the form of a lighter basin.

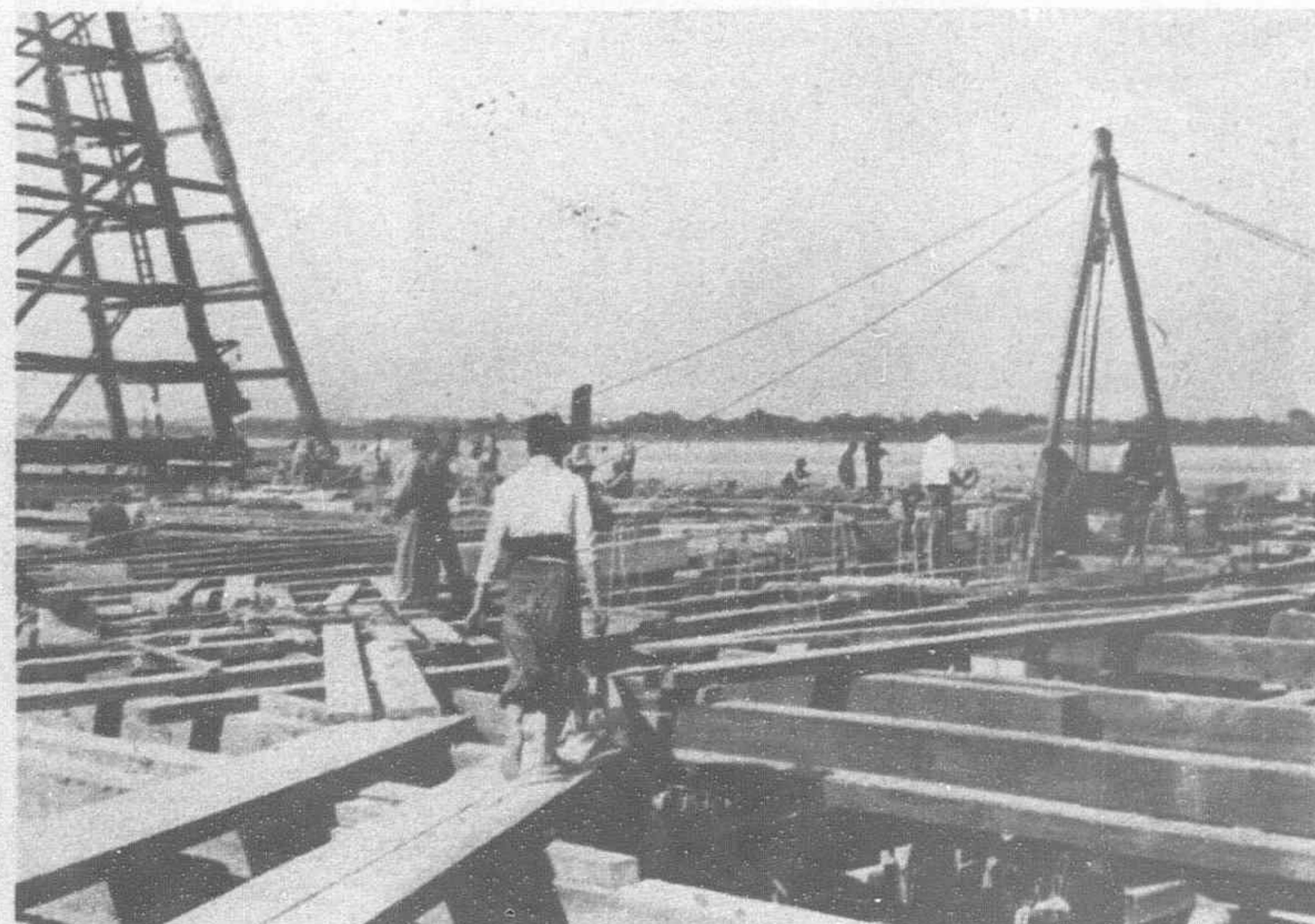
The wharf deck, 50 feet wide, has mooring equipment consisting of bollards and posts with an average spacing of 50 feet, besides cleats for the berthing of small vessels and lighters. In addition, crane-rails are placed for the ample crane equipment. At intervals, under the main deck, lower decks are constructed for the working of small craft and lighters at low water.

The filling of the land was carried out to 100 feet behind the wharf edge, where a retaining wall, partly of reinforced concrete, partly of wood, runs along the whole front. Each wharf is connected to this bunding by three 50 feet wide connecting bridges in reinforced concrete on wooden piles.

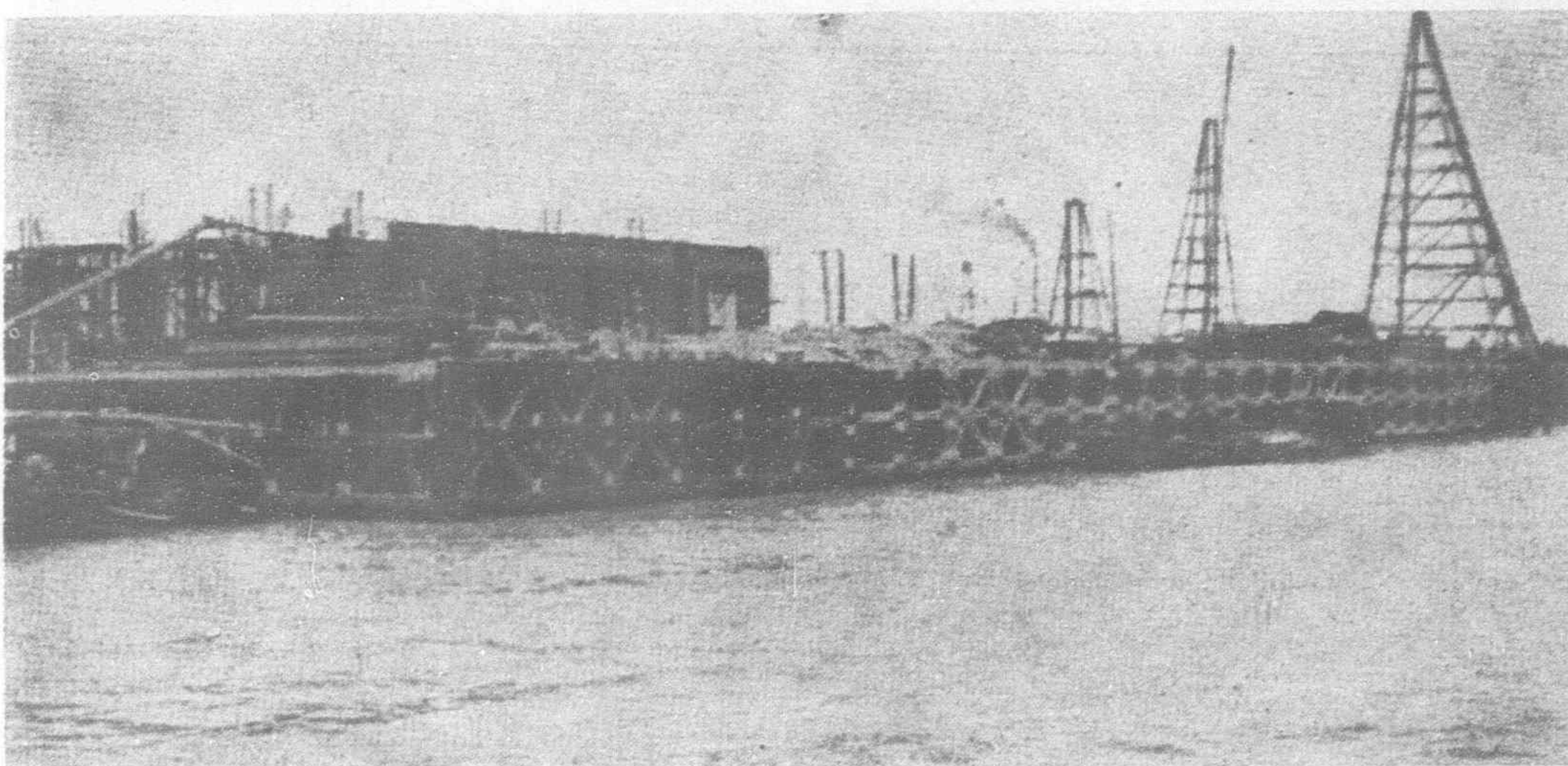
The space between these bridges is intended for warehouses, of which two are almost finished, except for some final touches. They are constructed of reinforced concrete on wooden foundation piles and are only built two storeys high, temporarily roofed at the second floor, so that they can be enlarged by two more storeys. The only cranes installed to date are of the gantry type.



Engineers on the job on the New Jukong Wharf



Showing another stage in the construction of the New Jukong Wharf



View from the Whangpoo River of construction work in progress on the New Jukong Wharf

The buildings occupy an area of about 220 by 130 feet. The front part, over a width of 50 feet, is constructed somewhat on the same principle as the wharf, allowing free flow of water underneath, conformed to the requirements of the Whangpoo Conservancy Board.

In addition to the above warehouses, erection work on two steel sheds is rapidly nearing completion. Covering an area of about 220 by 80 feet each, they are only a temporary arrangement, and shall later on be dismantled and moved to a different location.

Mechanical devices consist of eight elevating trunks, four stackers, four three ton mobile cranes, one ten ton mobile crane and 150 gravity rollers.

The construction up to date gives the property a length of 1,180 feet, over a frontage of about 1,500 feet. The storage space amounts to roughly 15,000 tons, giving about 12.7 tons per foot of wharf, and about ten tons per foot of frontage. These latter figures are rather low when compared with the average Shanghai conditions, the local wharves having usually considerably more space.

The Chapei Electric and Waterworks have already completed work on the laying of water pipes, and erecting of poles for light and power supply leading in from the Civic Center to the wharf site. A separate main pipe will be laid under the wharf deck specifically for the purpose of supplying water to steamers berthing alongside the wharf.

For eight months, dredgers of the Whangpoo Conservancy Board have constantly been pumping in liquid mud to the rear part of the main wharf site. The mark, 21 feet above Woosung horizontal zero, was reached in September, and that part has emerged from the state of a temporary lake into fairly firm land. The filling will for a period of time still be soft, which, however, does not exclude the possibilities of erecting even heavy structures anywhere on the site, as long as the weight is transferred to the lower strata, for instance by means of piles.

Of particular interest for the visitor is the office building, located between the two wharves. Two storeyed, and built in brick, it is practically complete except electric lighting and interior decoration. It contains the Customs' examination rooms and passenger waiting rooms, besides the wharf offices.

The passenger waiting room includes facilities which give service and pleasant surroundings for the passengers and their friends on a scale, so far unequalled, in Shanghai. There is a travel office where information on hotels, and train and boat schedules will be given to the passengers. People meeting friends will wait in the spacious lobby and balcony, where they are protected

against the discomfort of the weather and can see the berthing and departure of ships.

On the two sides of the lobby are telephone booths, stalls for flowers and newspapers, as well as restaurants. By standing at this vantage point, people are able to see the passengers as they go through Customs examination in the main hall below.

Also ready for occupation are the various residential quarters standing on a separate compound of some 50 mow. Here, landscaped along the lines of Shanghai's most expensive residential quarters, are 12 single houses, six duplexes, four bungalows, one dormitory building and a large residence. The residence, with its individual lawn facing the Jukong Creek, will be occupied by the Wharf Manager, while the bungalows will be used by the wharf employees

and the Customs officials. Married staff members of the wharf will live in the single houses and duplexes which are well-built and equipped with modern sanitary facilities.

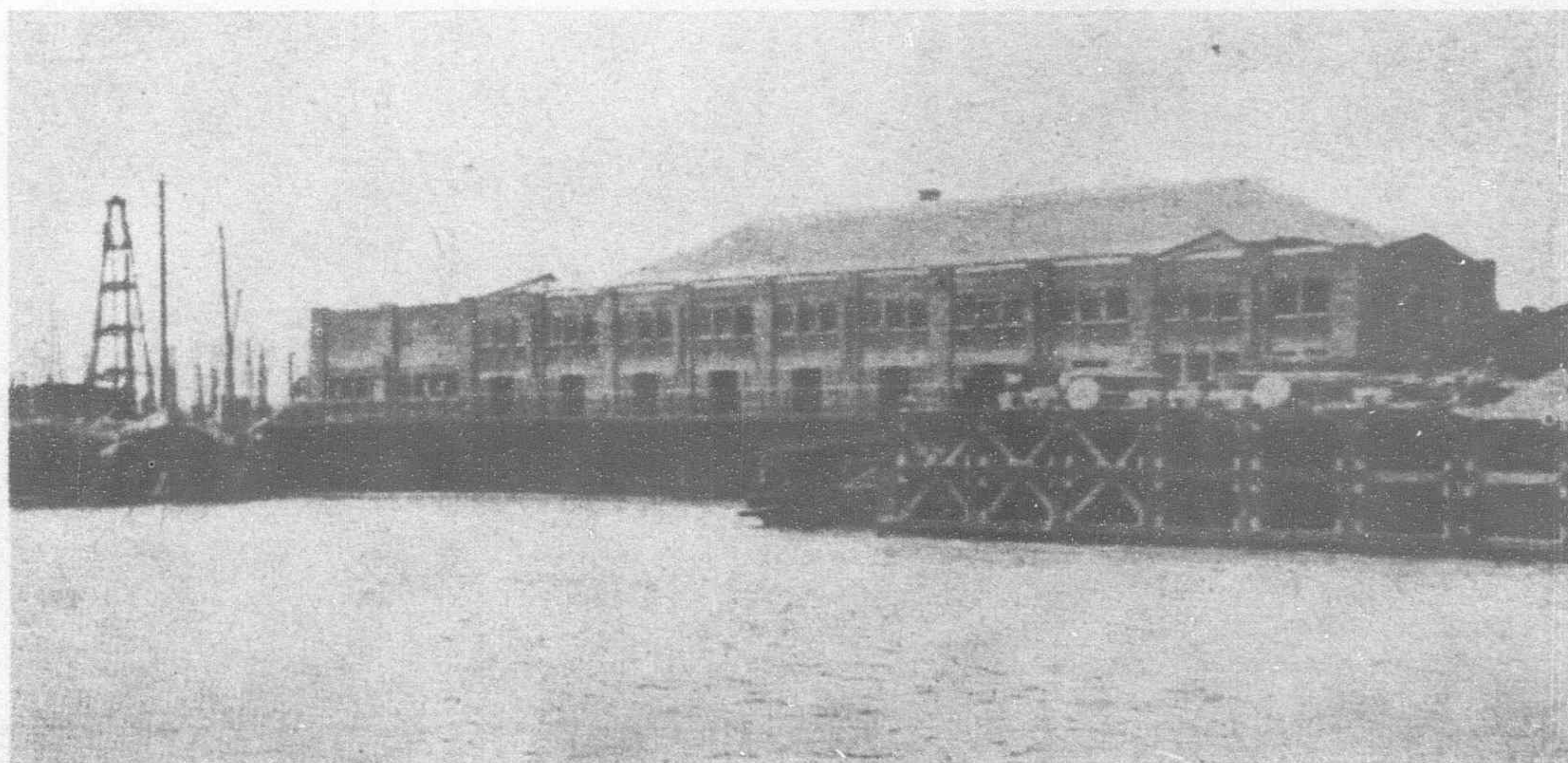
In the staff dormitory, where 60 unmarried workers of the wharf will be housed, are located the club house, the library and the main dining-room. This building, together with all the other staff residences, forms a unit by itself and is apart from the wharf section proper. Lawns, a tennis court and children's playgrounds are provided for the recreation of the workers.

In another part of the wharf site is a little village for the laborers employed by the firm and their families. Construction on this portion, which will include 60 one-story houses, is now being rushed. Jukong Wharf officials believe that the entire village will be completed in two months.

The lay-out on this workers' quarters follows the plan of the model villages erected and operated by the City Government of Greater Shanghai. While the houses are built on unpretentious lines, the entire compound, occupying some 20 mow of land, includes two public bathrooms, one for men and another for women, ten co-operative stores, a place for washing and drying clothes.

The road system is laid out with a view to maintaining a strict one-way traffic. The main entrance is divided for in and out traffic with a gatehouse for watchmen, etc., in the middle.

Detailed plans for the laying of four railway tracks, three behind the godowns and one on the wharf deck in front, are now under way and construction is expected to commence in the not too distant future. The tracks will combine into one siding near the end of Wu Chuen Road, which will pass through the Woosung Industrial district to connect with existing railway lines. The siding measures approximate nine kilometers and will cost three-quarters of a million dollars in construction.



Another view from the river of the new Jukong Wharf, showing one of the huge warehouses

Transportation facilities was also one of the main principles which occupied the attention of the designers. Negotiations were conducted by the Wharf Construction Committee with the Settlement and Chapei bus company for linking up their services at some point near the Jukong Wharf. This negotiation resulted in the extension of No. 9 bus from Yangtzepoo Road to the Woosung Military Road at the terminus of the Chapei bus service.

Roads leading to all points of the city were also constructed. The trunk line going through Wu Chuen Road was recently completed. This road will bring passengers from the Bund to the Wharf in 20 minutes.

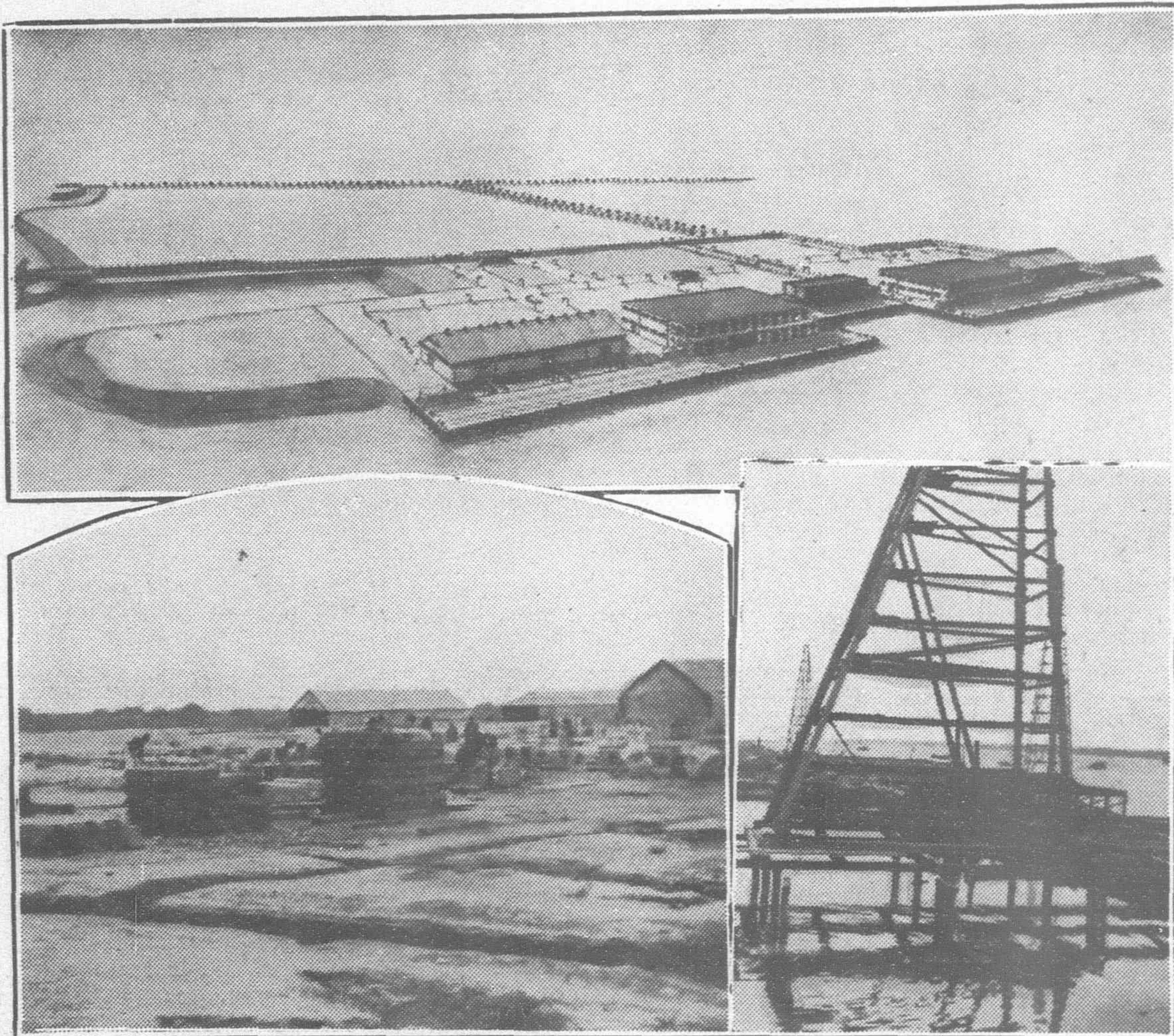
To facilitate air transportation, in addition to land and water transportation, a part of the land lying immediately behind the wharf site up to the Military Road, which is entirely free from any important buildings, will be converted into an aerodrome, while the river front will also be utilized for the same purpose, according to the Civic Center Scheme already adopted by City Government Authorities.

With the operation of the siding and the airline behind the site, the wharf will become the center of air, land and water transportation of the country—a step which will set a precedent and mark a new era in the history of overseas shipping facilities in this part of the world.

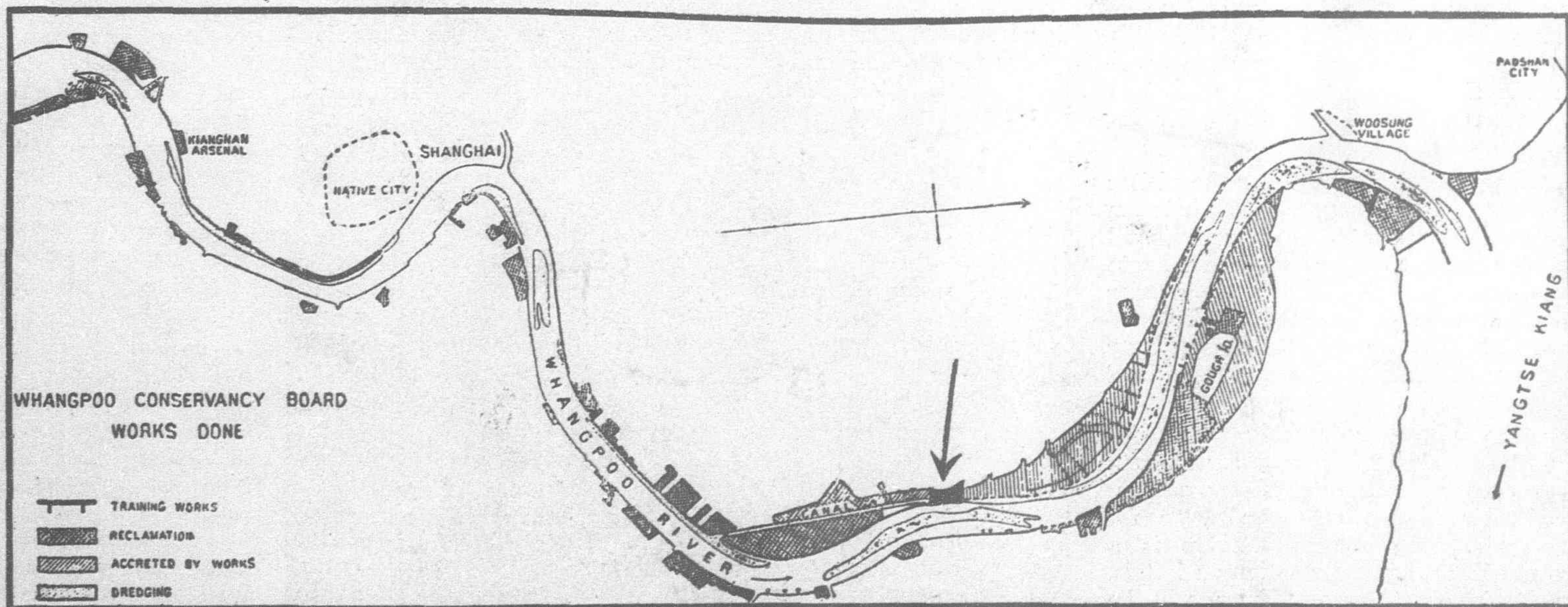
Most of the big steamship companies do not have their own wharf frontage, such as the Lloyd Triestino, P. & O., Canadian Pacific, and Messageries Maritimes. The Dollar Company has its own on the Pootung side. It is understood that some of these companies are already negotiating for privileges on the Jukong Wharf, which, with only finishing touches to the interior decoration

and to levelling the roads to be completed, is ready to start operation as soon as orders to this effect are given by the Central Bank of China which financed the gigantic project.

Officials in charge of design and construction were convinced, when interviewed, that the Jukong Wharf, with its facilities provided for both the shipowners and passengers, will have a definite value in promoting the overseas shipping trade of Greater Shanghai.



Sketches of the New Jukong Wharf area ; at lower left warehouses that have been erected



Map showing general scheme of Whangpoo Harbor in relation to the New Jukong Wharf near Point Island Canal. Black square and arrow shows location of the New Wharf

Interesting Turbines Supplied to Japan

Notable Power Plant Installations Built and Supplied by AEG

THE vast increase in the consumption of power in Japan during recent years has entailed the extension of practically every power station in that country. Among others the Toho Electric Power Co., Ltd., which supplies the industrial districts of Kansai and Kyushu with electricity, found it necessary to extend their Nagoya steam power station. Two steam turbine sets, each of 35,000 kw. output, were already installed in this plant. As a result of detailed consideration it was decided to order a further turbine unit of the same capacity, together with a 3,000 kw. house service turbine. The contract was awarded early in 1934 to the Allgemeine Elektrizitäts-Gesellschaft, Berlin, through their Japanese agents Messrs. Okura & Co., Tokyo.

When comparing the various designs of turbine, assuming equal efficiencies, the simplest must be given the preference, as it is in the best position to fulfil the chief requirement of every plant—absolute reliability. In this respect impulse turbines with a moderate number of stages and large blade clearances, as developed by the AEG during the past 30 years, are doubtless in advance of all other designs, as they fulfil all requirements in regard to reliability, economy, simplicity of operation, quick starting, amenability to load regulation, and long life.

The illustrations show the main turbine during workshop assembly. A two-cylinder design was adopted with the object of giving the most economical steam consumption on the base-load service for which the machine is intended. The h.p. cylinder contains one single-row stage with partial admission and 15 stages with full admission. From the h.p. cylinder the steam passes through two large sized overhead connections to the l.p. section, where it expands down to the condenser pressure in five further impulse stages.

Steam from the boilers at 310 lb/sq. in. (22 atmos.) abs. is admitted through a steam chest containing the five regulating valves and the live steam nozzles. When it enters the turbine, therefore, it is already at moderate pressure. Each of the regulating valves is connected with a certain

group of steam nozzles. As the load rises the valves open gradually one after the other, each valve being almost fully opened before the next comes into action. This principle practically eliminates throttling losses at partial loads, thus ensuring a very flat steam consumption curve between zero and full-load.

The two turbine runners and the alternator rotor are each supported by two bearings. The l.p. runner is connected to the alternator through a rigid coupling, while a flexible coupling lies between the h.p. and l.p. sections. The outer bearing pedestal and the central bearings are mounted on separate sole plates, so allowing the casings to expand freely in all directions while retaining their concentric alignment with the runners. Single-ring thrust bearings with movable pads are employed to locate the runners axially. Due to the slightness of the axial thrust occurring in impulse turbines the size of these bearings is small. The casings are split horizontally,

and the upper part of the h.p. section carries the automatic regulating gear. The h.p. and the l.p. runner discs excepting the first, which is mounted in a special manner, are pressed with slightly conical bushes on to the plain shaft and held together by a shaft nut, this ensuring reliable fixing and easy dismantling. In the h.p. section, where their height is small, the nozzles on the fixed diaphragms, which convert the steam pressure into velocity, are of the built-up type and consist of steel plates fitted with independently machined steel nozzles; diaphragms with cast-in nozzles are employed in the l.p. section. Double protection against overspeed is provided: the governor closes all regulating valves as soon as the speed exceeds 1,800 r.p.m., and the emergency governor instantly closes the main steam valve upon the speed rising to approx. 2,000 r.p.m.

Steam exhausted from the last stage of the turbine passes over to the two surface condensers each of 20,000 sq. ft. (2,000 sq. meters) area, installed parallel to the turbine shaft. Both condensers are equipped with condensate and circulating water pumps driven by electric motors. The air is

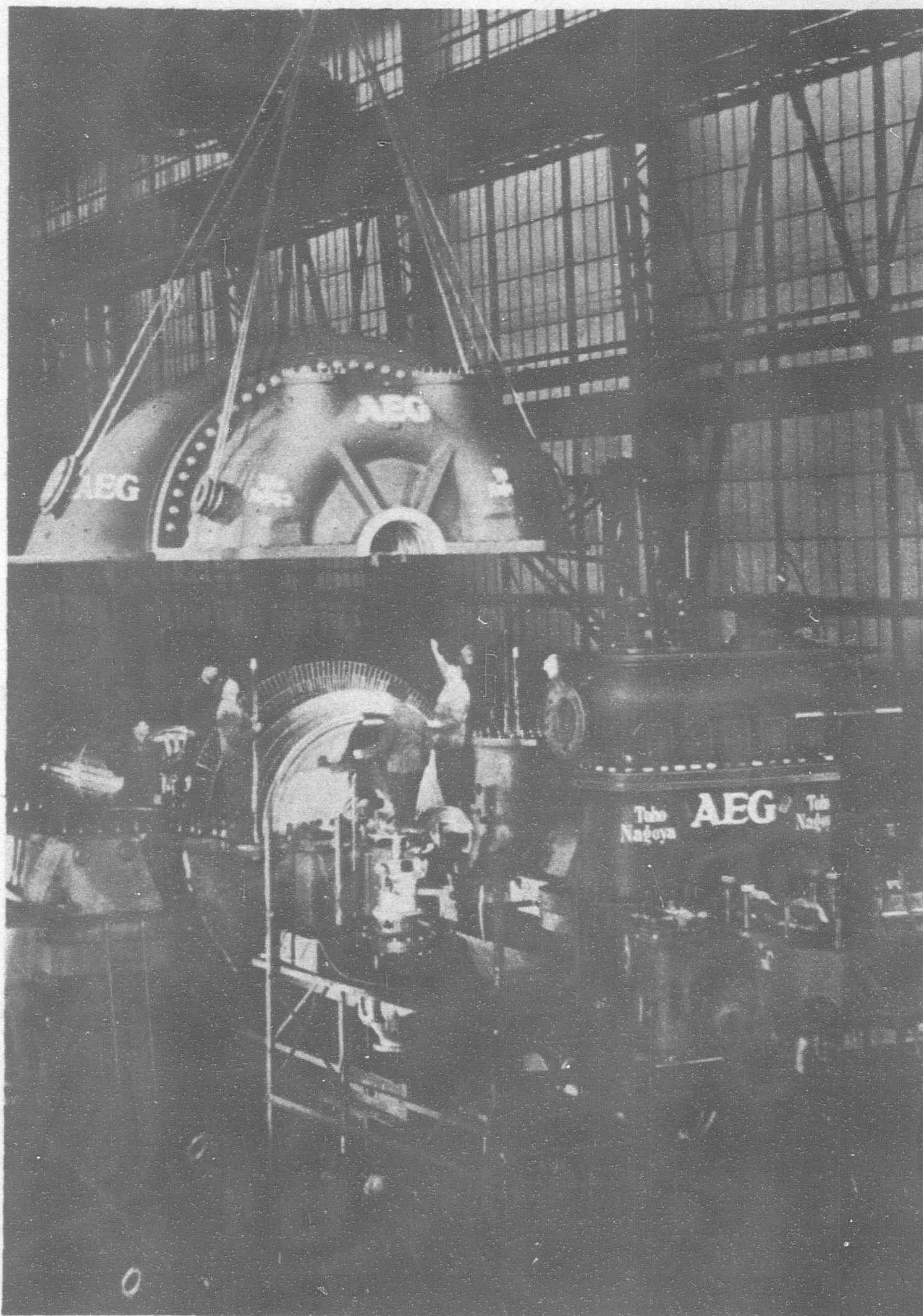


Fig. 1—35,000 kw. turboset for the Nagoya Power Station pictured during workshop assembling

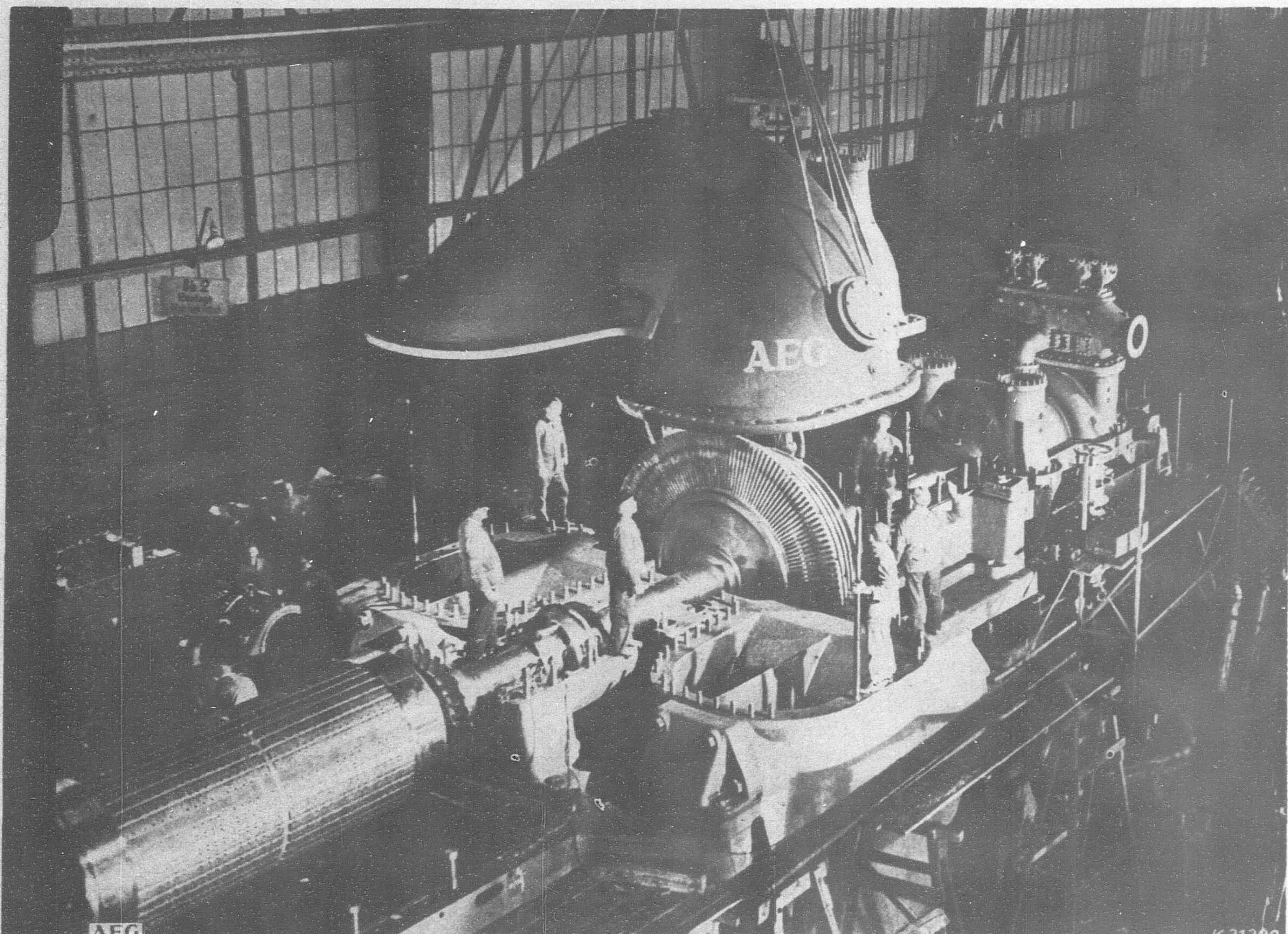


Fig. 2—Another view of the 35,000 kw. turboset for the Nagoya Power Station from photo taken during workshop assembling

evacuated from the condenser by a steam-jet air ejector.

The 60-cycle, 11,000-V three-phase alternator is rigidly connected with the l.p. turbine spindle, and has a rating of 35,000 kw. at 0.8 power factor. The rotor runs in two bearings which are bolted to the bedplate, and is constructed in three parts. The winding lies between blocks of laminations which are dovetailed into the forged body. This design reduces the weight of the forging by almost one-half, hence making for more thorough forging, and allowing the former-wound coils to be hard-pressed and ready-baked throughout prior to their assembly on the rotor. This practically prevents changes and displacements of the layers of insulation and obviates the consequent short-circuits. The stator winding is constructed of straight micanised bars with attached involute end connectors. Prominent features of the bar-involute winding are easy assembly, good accessibility, and satisfactory ventilation.

(Continued on page 34)

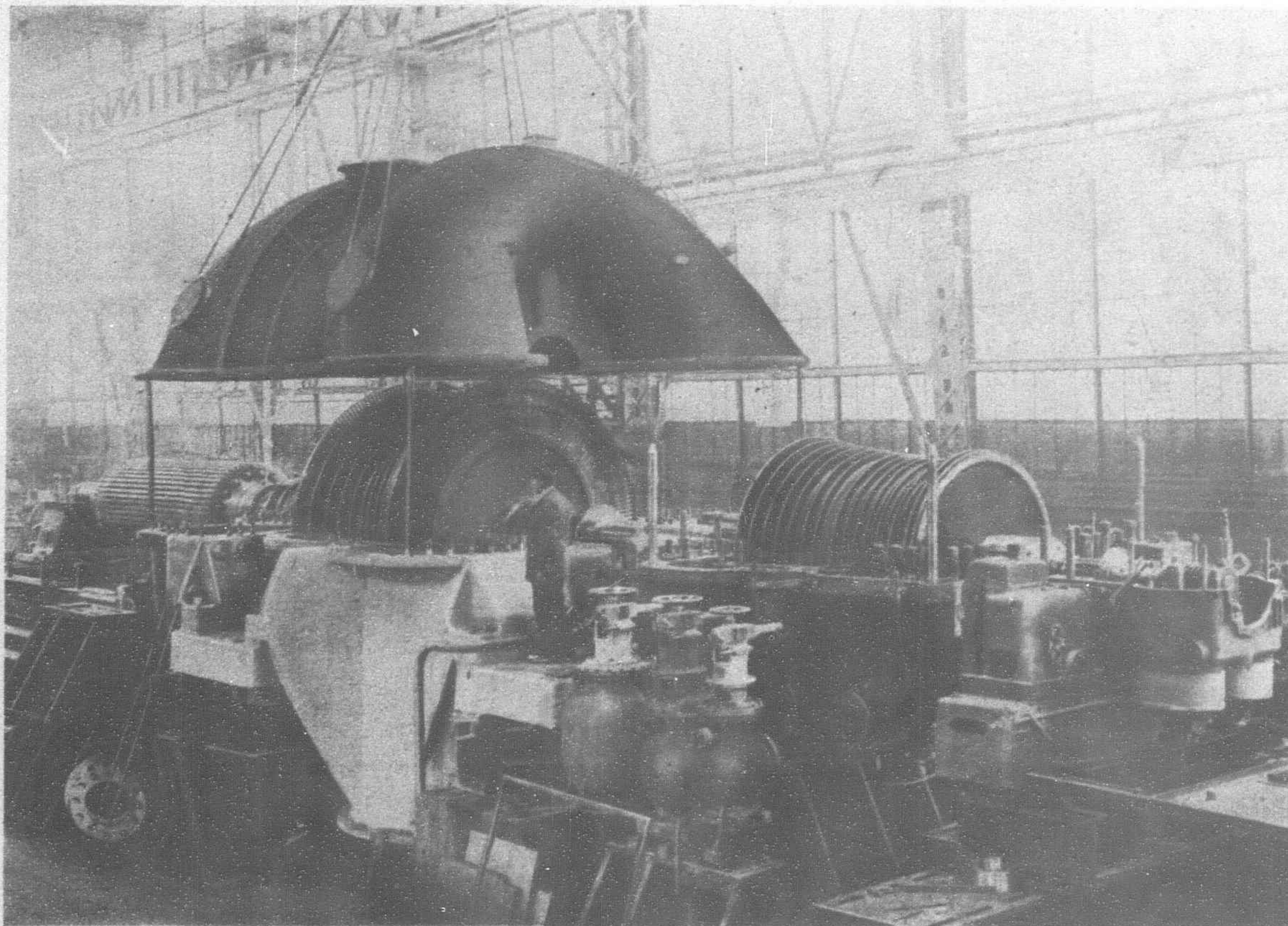


Fig. 3—Showing the 53,000 kw. turboset for the Tsurumi Power Station during workshop assembling

Sluice Gates for Regulation of the Huai River

ONE of the largest and most useful engineering feats ever attempted in China is the regulation of the Huai River system, undertaken by the Huai River Commission under the auspices of the National Economic Council.

In the past, enormous tracts of land have been inundated periodically due to the overflowing of the Hung Tze Lake and the Huai River with its tributaries, causing not only tremendous damage to the farm land, but also serious losses to life and property.

Ever since ancient times attempts have been made to cope with this ever-returning danger by constructing dikes wherever the necessity arose, but as all these attempts were only made locally and without co-operation between the different districts, they were of little avail.

The National Economic Council, in consideration of the seriousness of the situation, have entrusted the Huai River Commission with the important task of finding a practical solution to the problem. Under the able leadership of Chief Engineer Shu Kai, a selected staff of experienced and efficient engineers have made an extensive survey of the river system and collected important topographical and hydrological data.

Based on this information, an elaborate scheme has been developed, involving excavation and dredging work on the river and the newly-to-be-constructed flood channel on a hitherto unprecedented scale. The scheme requires also extensive construction of dikes, involving the shifting of many millions of cubic meters of earth, and culminating in the building of a barrage which, on completion, will be over 750 meters in length. This barrage or regulator will be situated close to the Hung Tze Lake, through which the water will enter the newly-to-be-constructed flood channel, and will serve to control the water level and overflow of this lake. The estimated discharge through the regulator will be at the rate of 6,000 to 9,000 cubic meters per second. This large amount of water, discharged at a high velocity, exerts a tremendous pressure against the regulator

and the discharge gates located therein, which only the best design and material can withstand.

For the regulator gates, the "STONE" type with free roller movement was selected as the most suitable, and Messrs. Glenfield & Kennedy of Kilmarnock, Scotland (one of the foremost manufacturers of sluice gates), were entrusted with the design and fabrication. Messrs. Glenfield & Kennedy have had very extensive

experience all over the world in the construction of sluice gates, especially in India, where practically all the large regulators in connection with storage reservoirs and river regulation have been supplied by them. Their agents in China are Messrs. Arnhold & Co., Ltd.

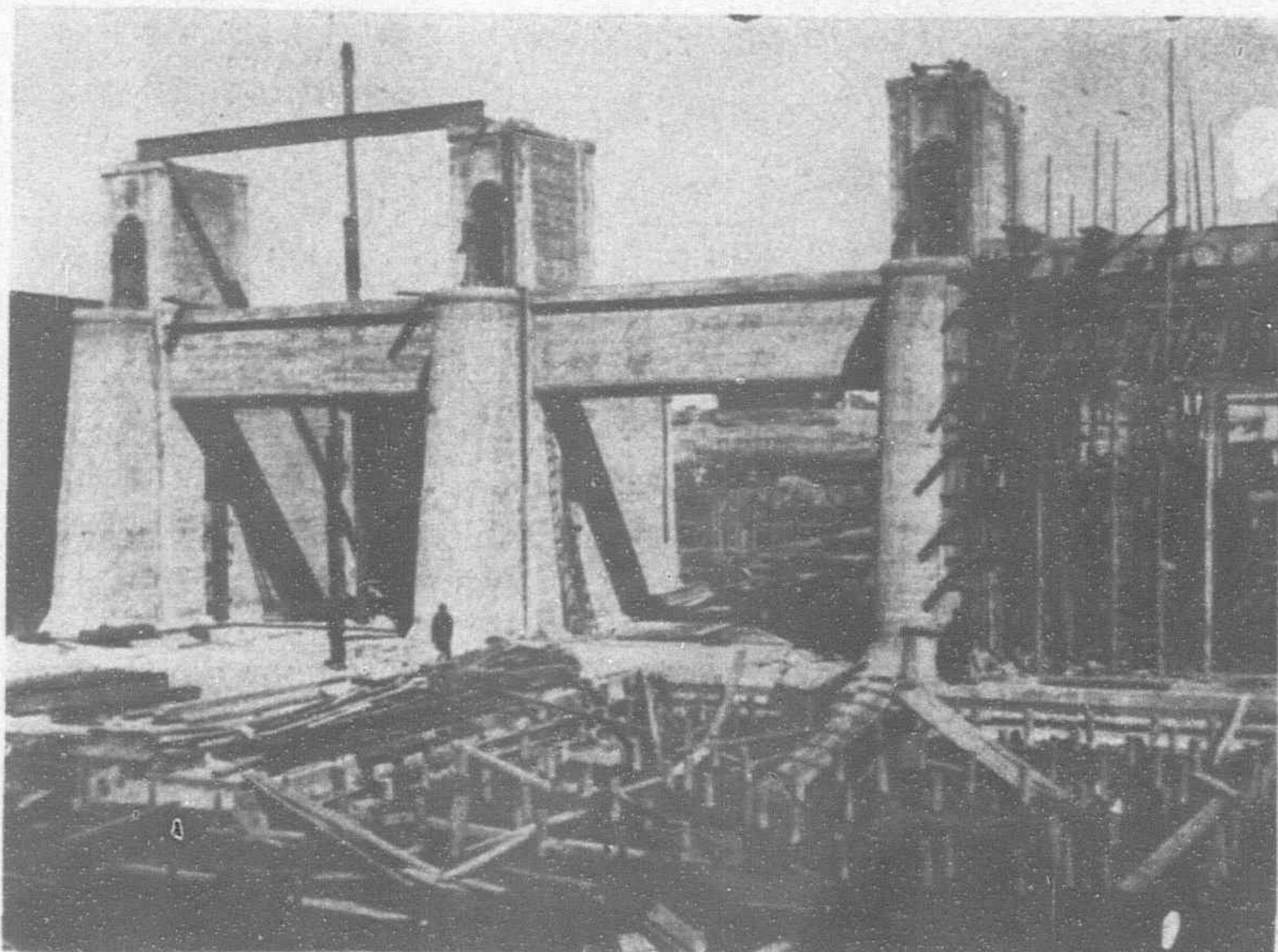
The sixty sluice gates forming the Chiangpa Regulator, near the Hung Tze Lake, will each be 10 meters wide by 5½ meters high, and will weigh over 22 tons each. To either raise or lower these large gates, however, only one man is required to operate the winding mechanism. This remarkable feat is accomplished by carefully counterbalancing the heavy gates and employing a nearly frictionless movement. All the essential parts of the gates, the roller trains and the operating gear are manufactured at Messrs. Glenfield & Kennedy's Works at Kilmarnock, while the structural part of the gates and operating bridges will be fabricated in Shanghai from high class imported steel at the Works of the China Car & Foundry Co., Ltd., under expert supervision and with the help of most up-to-date machinery.

The Up and Down movements of the gates are guided by specially designed channels embedded in the concrete of the piers. These channels

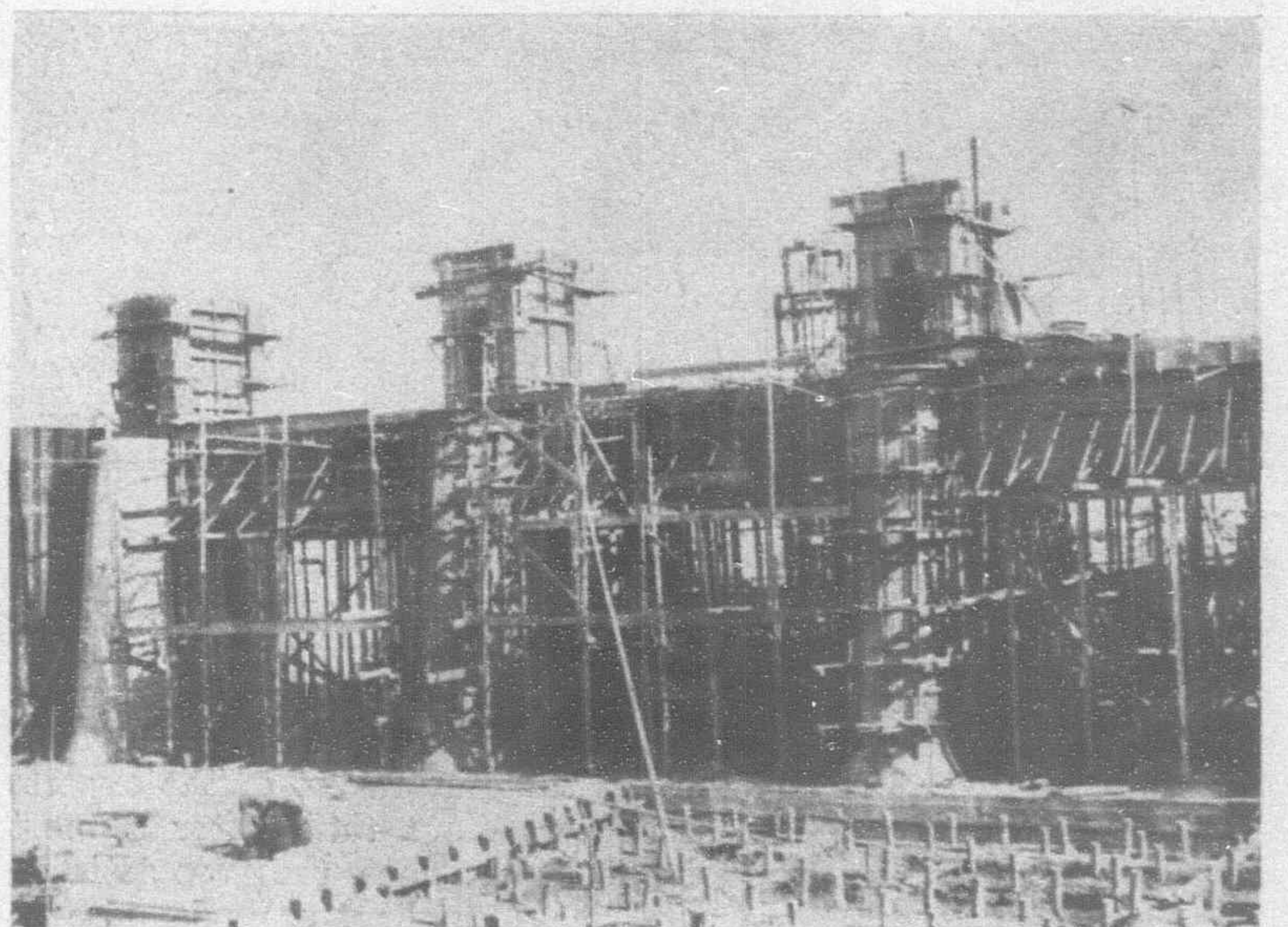
also contain the train of rollers which transmit the water pressure acting on the gates to the concrete piers. The gates are built up of heavy section structural steel, reinforced at the down-stream end with heavy bow-string girders; while the part facing up-stream is covered with heavy steel skin-plates. Suitable staunching bars placed at both sides of the gates effectively prevent any leakage, while a tight joint is maintained both at the sill and lintel girders,



Completion of the first gate opening



Openings ready for steel structure



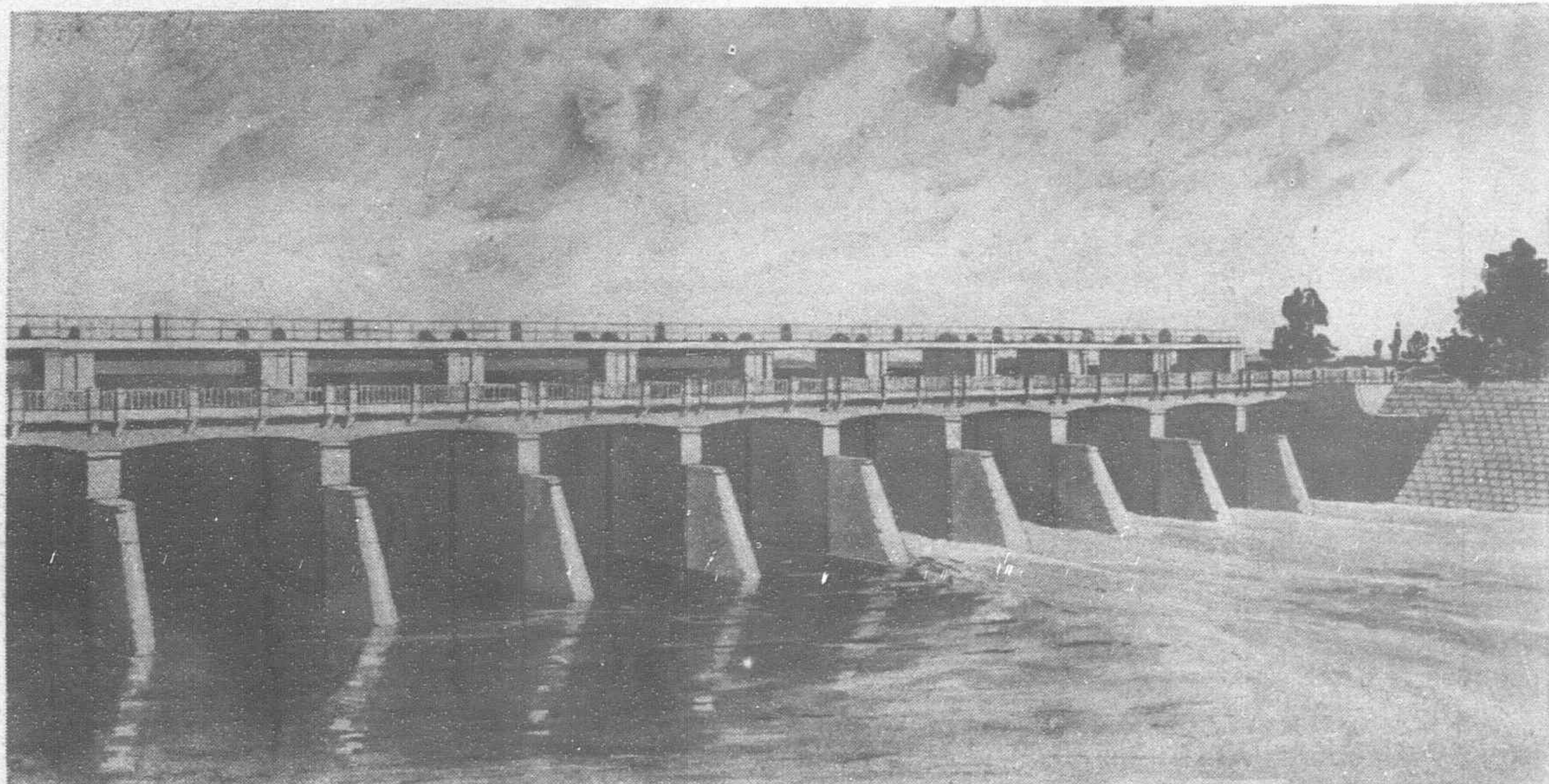
Early stage showing concrete piers under construction

thus effectively sealing the opening against any possible leakage. At a certain height above the gates, steel bridges are located which carry the operating mechanism. These bridges, joining one to another, form one continuous pathway over the entire structure, leading from one bank of the river to the other.

The winding mechanism consists of gear winches operating on shafts, terminating in winding drums which carry the lifting rope from the gates to the counter-balance. The ratio of the gearing is so selected that one man can either lift or lower a gate by turning a crank. If exceptional speed is required in either lifting or lowering the gates, this can be accomplished by Diesel engines mounted on trolleys, which run on rails along the whole length of the operating bridges.

All the moving parts embodied in the design of the gates and the winding mechanism are readily interchangeable, while the gates themselves and the operating bridges require practically no attention whatsoever, except occasional painting. The maintenance and up-keep of these structures are therefore very economical.

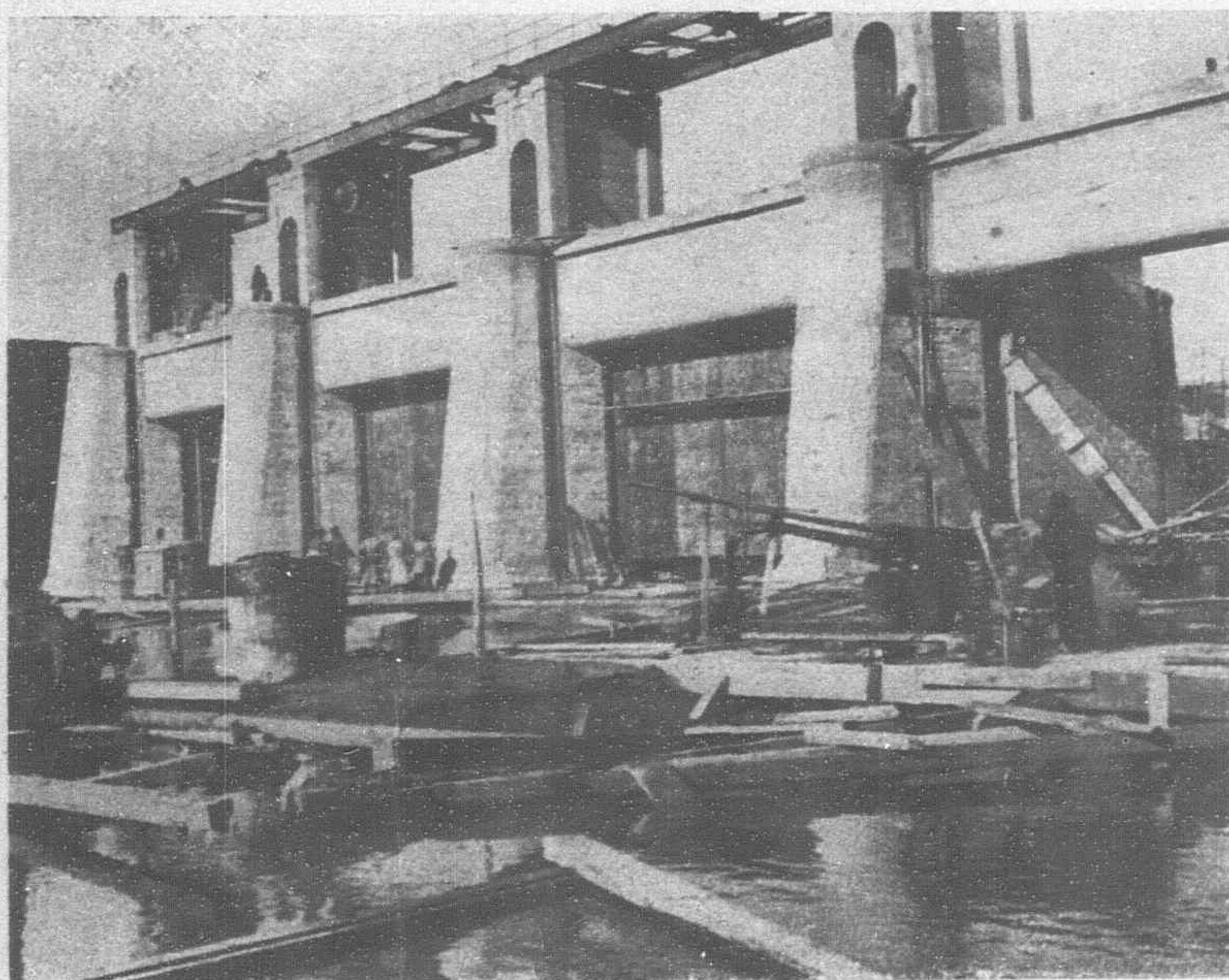
A set of five gates of similar construction, also fabricated by Messrs. Glenfield & Kennedy, and the China Car & Foundry Co., Ltd., has already been supplied to the Huai River Commission for regulating the flood water from Hung Tze Lake but flowing in a northerly direction following roughly the old bed of the Yellow River. This regulator is situated near Yangchuang and will fulfil a



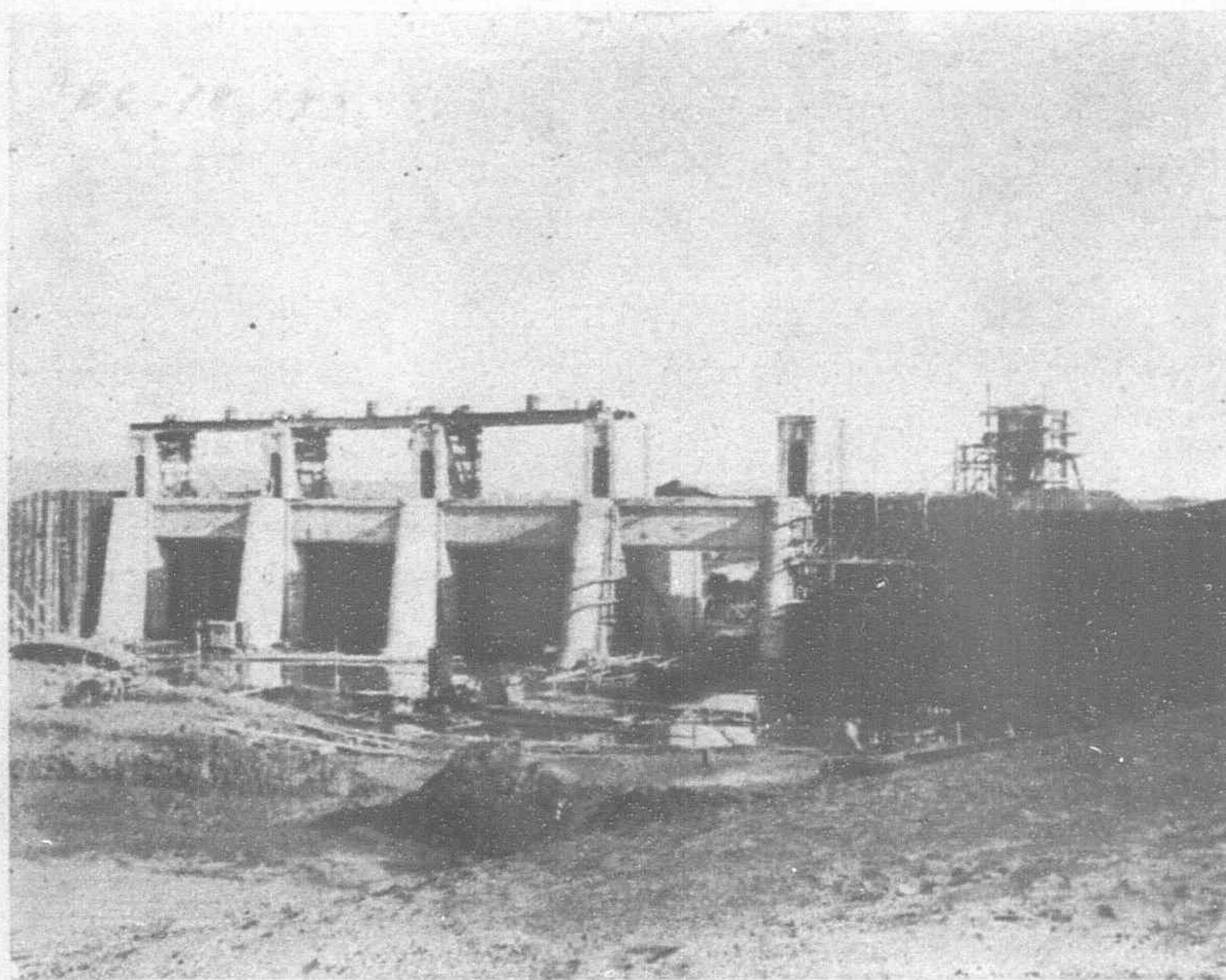
Perspective view showing how a part of the 60-gate regulator will appear when completed

very important function in preventing any inundation of land situated between the lake and the sea. The accompanying illustrations show these five gates under erection.

The construction of these two regulators marks the beginning of a fundamental revolution in flood prevention in China. A tremendous amount of work still lays ahead of the National Economic Council, but now that this start has been made there is no reason why the almost yearly floods with all their damage and misery should not be counted a thing of the past. The National Economic Council is to be congratulated in the energetic way it is pursuing the work it has started, which will be to its lasting credit and an object of continuous gratitude by the people in the affected areas.



Completion of first three gates



Another view of completed gates

KWANGTUNG IRON AND STEEL WORKS

Mr. K. Lund has returned to China from London. As representative of British engineers, he completed a contract last year for the erection of iron and steel works at Canton. A special committee of British experts has completed a survey of the mineral resources of Kwangtung in order to ascertain whether these resources are sufficient to justify the establishment of an iron and steel industry, and Mr. Lund announces that the report of the experts is highly satisfactory. The engineers state that, after a most thorough investigation throughout the province, they are satisfied its natural resources "are suitable in quality, are adequate in quantity, and can be mined and assembled at a central location at such costs as will fully justify the establishment of an iron and steel

industry." The experts report considerable reserves of iron ore in various parts of Kwangtung province, large quantities of limestone of high quality suitable for the iron and steel making processes, and valuable deposits of coal, the largest of which are near the Canton-Hankow Railway on both sides of the boundary line between the provinces of Kwangtung and Hunan. The report concludes: "Having surveyed the chief deposits of the raw materials required, tested these materials, and studied the problems involved in their transportation to a central location, we beg to report that they are, in our opinion, suitable in quality and adequate in quantity to form the basis of an iron and steel industry in Kwangtung."

Refrigerating Installations in the Union Brewery at Shanghai

THE Union Brewery Ltd., Shanghai, has put into service a new brewery, which is equipped with the most up-to-date machinery, and can claim to be the largest brewery in China. The brewery is equipped to produce 6,600,000 gals. of beer per annum, and consists of a number of reinforced concrete buildings (fig. 5) viz:—a nine-story cellar building, a brew-house, an engine and boiler house, a bottle filling and bottle cleaning building, a bottle storage house, a workshop and an office building, the latter containing also the quarters for the foreign staff.

The order for the refrigerating plant was passed to Sulzer Brothers. This plant comprises two horizontal two-stage ammonia compressors (fig. 6), each with a refrigerating capacity of about 1,080,000 B.Th.U./h at a temperature of evaporation of 9°F . and a temperature of liquefaction of 104°F . Each compressor is direct coupled to a Brown-Boveri synchronous motor and requires about 160 b.h.p. when running under the above-mentioned conditions. The condenser is of the Sulzer high-efficiency multi-tubular type, and consists of separate elements which can be connected together in various ways to suit the prevailing conditions.

The cooling-water, required for the refrigerating plant, is taken from wells equipped with Sulzer borehole pumps.

The brine coolers are of the shell-and-tube type. Two units are installed, each comprising an inner nest of tubes in which the brine to be cooled circulates, and also an outer shell. The tubes are expanded into the ends of the shell, which are closed by covers shaped in such a way that suitable circulation of the brine is assured.

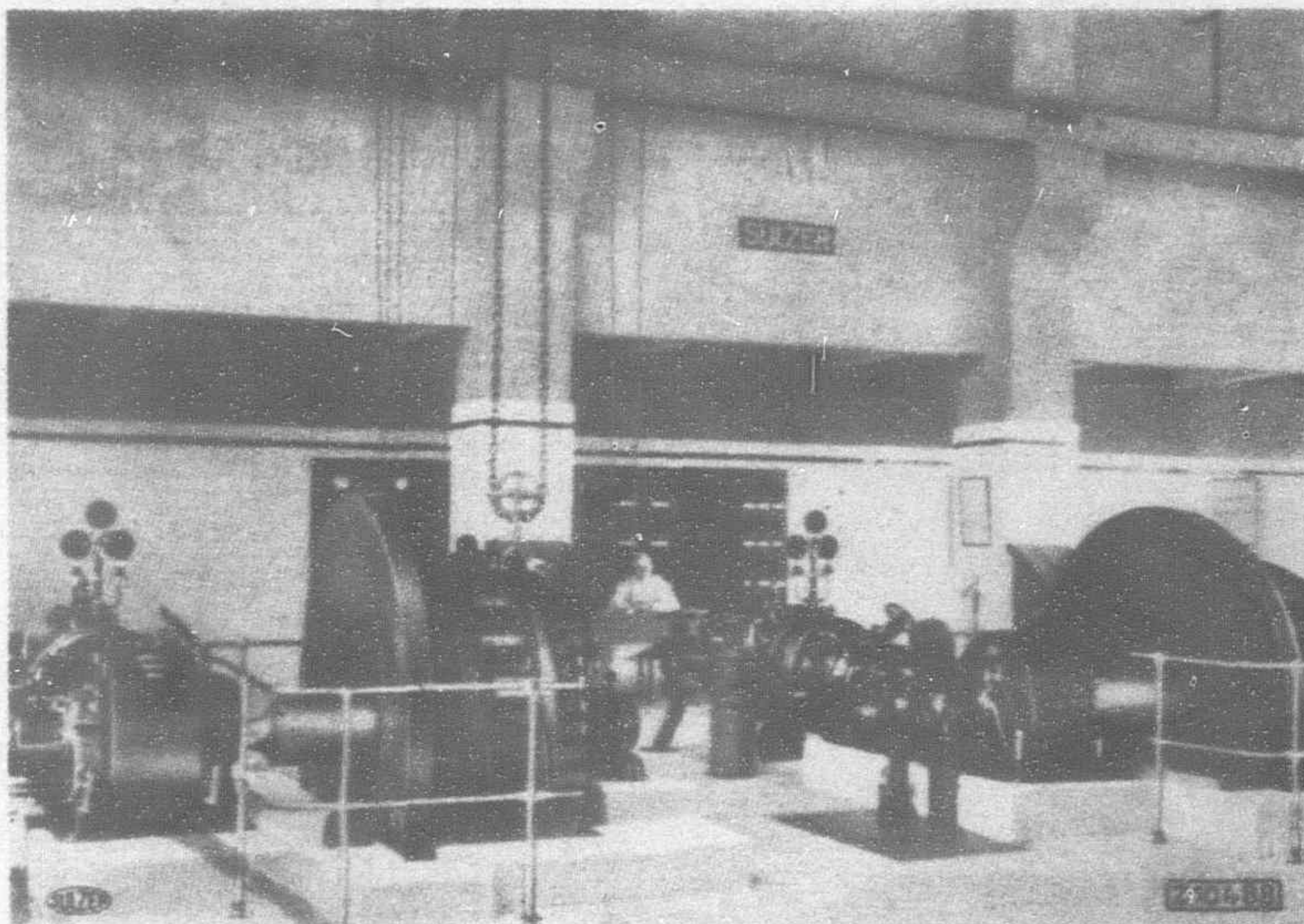
The coolers are lagged with insulating material of ample thickness, so that the loss of cold is practically negligible. The brine is cooled down to about 27°F .

An electrically-driven Sulzer brine pump of the centrifugal type supplies the cold brine to the lower part of the wort cooler, whilst another pump of the same capacity sends cold brine to the pressure tank room in the bottle filling building.

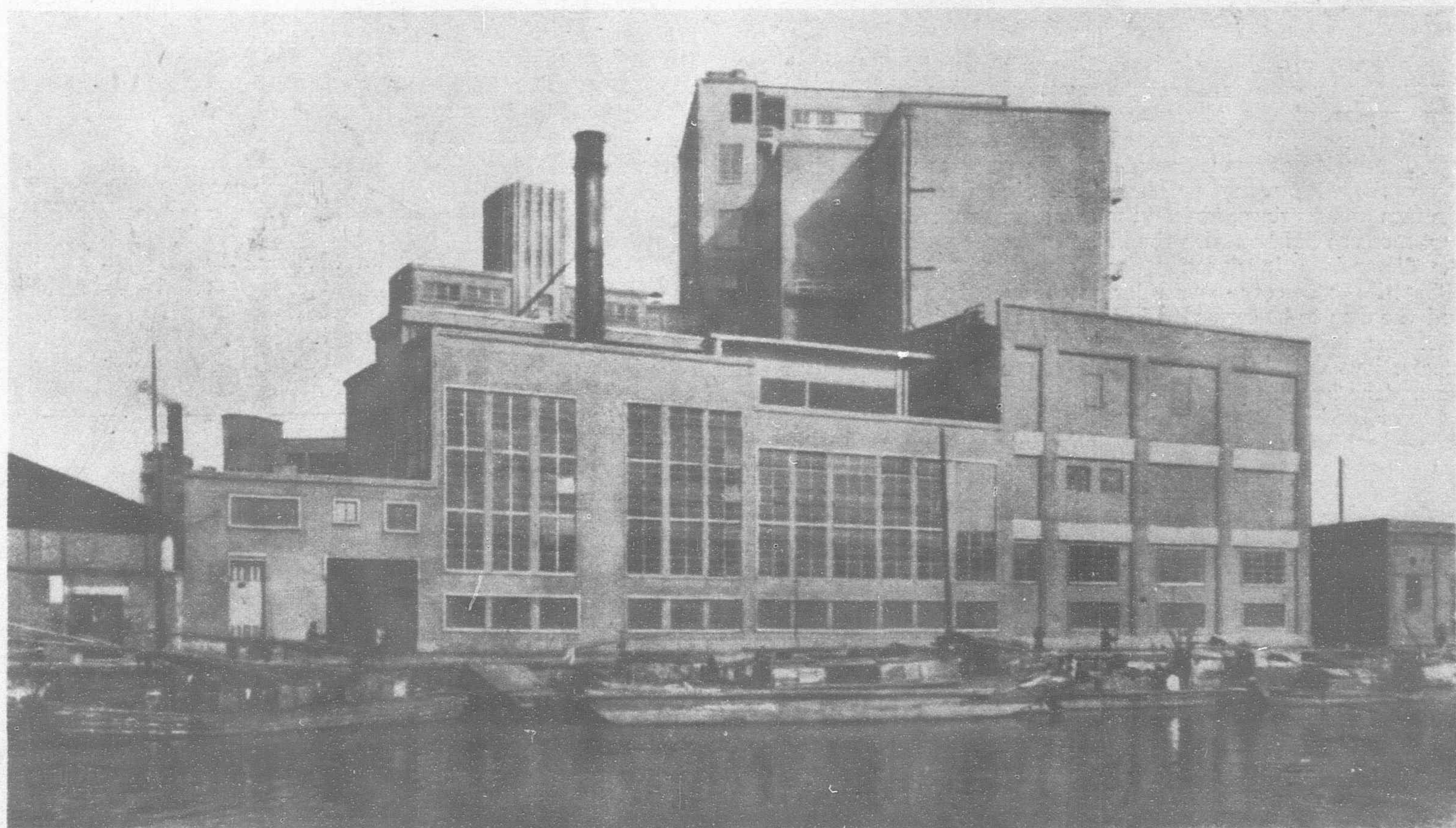
Three pumps, one of which is spare, deliver cold brine to the different air coolers and the cold fresh-water tank. After having passed through the different cooling-systems, the warmed brine is collected in a tank situated on the third floor of the cellar building, from where it flows back to the two coolers.

Next to the two brine coolers, a well-insulated fresh-water cooler, with a capacity of about 33,000 gals. is installed; in it the water is cooled down to about 32°F . Four vertical electrically driven agitators assure good circulation of the water in the tank.

Two electrically-driven pumps, one of which is spare, supply cold water to the upper part of the wort cooler; two other pumps,



Machine room of the Union Brewery, Shanghai, with two Sulzer ammonia compressors, each with a refrigerating capacity of 1,080,000 B.Th.U./h at a temperature of evaporation of 9°F . and a temperature of liquefaction of 104°F .



View of the Union Brewery Shanghai, (L. E. Hudec, Architect), equipped with Sulzer refrigerating plant

one of which is also spare, deliver cold water to the cooling coils in the fermenting tanks.

Brine coolers, fresh-water cooler, brine and fresh-water pumps are located in a room on the ground floor of the cellar building next to the compressor room.

Several air coolers have been installed. Each cooler contains coils through which cold brine circulates, and is combined with a Sulzer fan driven by belt from an electric motor. One air cooler supplies the cold air for the beer storage cellars, the barrel filling cellar and all the anterooms on the first, second and third floors of the cellar building. A second air cooler serves for cooling the hop cellar, whilst a third cools the fermenting cellar, the preparing room for the fermentation, the yeast growing and washing rooms, and the room in which the wort cooler is installed. This last cooler is combined with one filter for the circulated air and another for the fresh air, so that only sterilized air enters the room, thus eliminating any danger of infection.

One of the storage cellars is equipped with Rostock tanks. The beer in these tanks is cooled by means of cold alcohol circulating in coils. Two electrically-driven alcohol-water pumps, one of which is spare, assure good circulation in the cooling coils. An alcohol-water cooler with automatic temperature control is installed in the anteroom on the first floor in front of the Rostock tank cellar. The alcohol-water is cooled by direct expansion of ammonia. Other storage cellars are equipped with enamelled iron tanks.

In addition to the complete refrigerating plant with motors, air filters and insulating material, Sulzer Brothers also supplied and erected two borehole pumps. One of these pumps is situated in the compressor room, the other in a separate house in the courtyard. The first of these pumps delivers about 500 gals. per min. against a total head of about 296-ft., the power absorbed being about 67 h.p. The second pump supplies about 700 gals. per min. against the same total head and absorbs about 91 h.p. Both pumps are direct coupled to electric motors, operated automatically by means of a float switch installed in a tank on the sixth floor to which the pumps deliver the water. From here, part of the water flows by gravity through the condenser and then back into a tank on the third floor, from where it is taken for use in the brewery for general purposes.

Interesting Turbines Supplied to Japan

(Continued from page 30)

The alternator cooling air is continuously circulated through an air cooler by two fans at the ends of the rotor. Thus the temperature of the alternator is independent of that of the surrounding air, and complicated air ducts are avoided.

The design of a machine of such size presents the foundry and steelworks with many problems in the production of the large castings and forgings, and still more to the workshop, where each part must be finished with the highest accuracy. Bearing in mind the dimensions in question, one cannot fail to recognize the difficulties to be surmounted during the machining of such pieces, and the care to be expended in building machines of this kind and size. For instance, the upper part of the l.p. casing shown in the illustrations weighs 28 tons, and the lower section more than 57 tons. The length at the horizontal joint is 21-ft. (6.5. meters).

For further improvement of the overall efficiency the turbine is fitted with a two-stage preheating plant, in which the feedwater is heated to approx. 230 deg. F. (110 deg. C) by steam tapped from the turbine. The rise in the overall thermal efficiency is due to the fact that the tapped steam, after yielding up power in the turbine, supplies the remainder of its heat to the feedwater. Otherwise this heat would be dissipated in the condenser cooling water. With similar economical benefits a single effect evaporator was embodied with the preheater, generating the make-up water to replace the unavoidable losses in the water and steam circuit. Like the preheater, it is heated by unregulated bleeding steam.

Also supplied by the AEG the house service turbine set of 3,000 kw. output covers the plant requirements for auxiliary drives, lighting, etc. It is a single-cylinder condensing machine of standard AEG impulse design, running at 3,600 r.p.m. With its extreme simplicity it can be brought up to speed very rapidly, and it is extraordinarily reliable.

The transport and installation of both units were concluded without hitch. Following successful acceptance tests the two

machines have now given some months of regular service to the full satisfaction of the proprietors.

Almost at the same time the AEG received from the Tokyo Dento K.K. an order for a steam turbine set of 53,000 kw. to be installed in their steam power station at Tsurumi. The unit consists of a 1,800 r.p.m. two-cylinder condensing turbine directly coupled to the 50,000 kw. main alternator and the 3,000 kw. house service generator. The large quantity of steam to be passed enforced the adoption of a double-flow low-pressure section, as shown in the photograph, which was taken during workshop assembly. Except for these points the set resembles that described in the foregoing. The great size and weight of the main stator prevented its being dispatched ready wound and with the laminations in position. This work had to be completed on site by special erectors.

Like the Toho set the turbine unit successfully passed its acceptance trials and has now been running for some months.

In view of the satisfactory results achieved with these two units the Taiwan Electric Power Co. has just ordered from the AEG a similar turbine set of 38,000 kw. output. It is provided with two alternators—one of 35,000 kw. feeding into the supply system, and the other of 3,000 kw. supplying the auxiliaries. The steam power station in which this unit will be installed operates in parallel with a hydro electric plant. At times when there is ample water available the latter will supply the whole demand. The main alternator of the steam unit will then be run as synchronous condenser for raising the power-factor of the system, and for this purpose can be uncoupled from the turbine. An automatic starting device employing the house service alternator as pony motor is being supplied by the AEG for running up the machine under these circumstances. A full description of this plant must be reserved for publication at a later date.

- Fig. 1 (TV 20176/18) 35,000 kw. turboset for Nagoya Power
 Fig. 2 (TV 20173/18) Station during workshop assembling.
 Fig. 3 (TV 11508/13) 53,000 kw. turboset for Tsumuri Power
 Station during workshop assembling.

World Uses More Tin

World apparent consumption of tin increased by 14 per cent in the year ended September, 1936, to 153,751 tons, against 134,916 tons in the previous year, according to the *Hague Statistical Bulletin* of the International Tin Research and Development Council. World production figures for the same periods were respectively 166,032 tons and 124,585 tons.

Details of tin consumption in the principal countries are given in the following table in tons of 2,240 lb.

	Year ended Sept., 1936	1935	% Increase or decrease
U.S.A.	71,218	56,771	+ 25.4
United Kingdom	21,959	21,557	+ 1.9
France	9,888	8,135	+ 21.5
U.S.S.R.	8,870	6,697	+ 32.4
Germany	8,481	10,781	- 21.3
Italy	6,000	5,374	+ 11.6
Other Countries	27,335	25,601	+ 6.8
Total apparent consumption	153,751	134,916	+ 14.0
Tin used in manufacture . .	151,200	136,900	+ 10.5
Change in consumers' stocks	+2,550	-2,000	

Consumption in Russia has again exceeded all previous records, and has more than doubled in the past five years.

In Japan, consumption of home-produced tin in 1935 reached a record figure of 2,027 tons, against 1,199 tons in 1934 and 950 tons in 1933. Total consumption of domestic and imported tin was 6,215 tons in 1935, against 5,190 tons in 1934, showing an increase of 20 per cent. Data regarding consumption of domestic tin in the current year are not yet available, but consumption of imported tin increased by 21½ per cent in the year ended September, 1936, to 4,622 tons, against 3,803 tons in the previous year.

Substantial increases in consumption are recorded also for Poland, 38 per cent; Czechoslovakia, 29.4 per cent; Canada, 12.7 per cent, and Belgium 10.5 per cent.

Malayan Railways Air-Conditioned*

Steel Coaches Fitted with Stone's Equipment Demonstrated Under Tropical Conditions Successfully at Smethwick

By permission of the Crown Agents for the Colonies and the Birmingham Railway Carriage and Wagon Co., Ltd., Stone's air-conditioning equipment as installed in two first-class bogie carriages built for the Federated Malay States Railways was recently demonstrated, under tropical conditions, at Smethwick.

Special interest attached to the demonstration because of the fact that the two coaches were the first vehicles to be built in England having self-contained electro-mechanical air-conditioning equipments with axle-driven generators.

The two carriages, identical in design and construction, have been built at Smethwick to the specification and requirements of the chief mechanical engineer of the F.M.S. Railways, Mr. A. W. S. Graeme, and to the order and under the supervision of the Crown Agents.

The following are the leading dimensions :

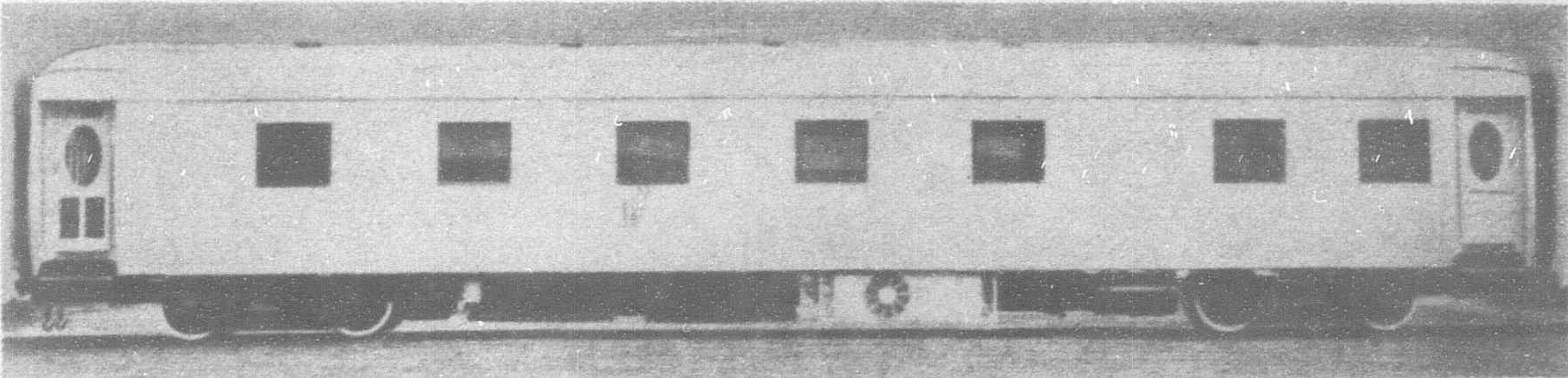
Gauge of line	1 meter
Length over body	60-ft. 0 $\frac{3}{8}$ -in.
Length over vestibules	62-ft. 6-in.
Width of body at waist	8-ft. 10 $\frac{1}{8}$ -in.
Height from rail to top of roof	11-ft. 8-in.
Centers of bogies	42-ft. 0-in.
Bogie wheel base	6-ft. 6 $\frac{3}{4}$ -in.
Diameter of wheels on tread	2-ft. 9 $\frac{1}{2}$ -in.
Buffer height from rail, light vehicle	1-ft. 10 $\frac{3}{4}$ -in.

In the two coaches, body and underframe are of all-steel construction, the specially insulated body being built integrally with the underframe. The floor is of teak, consisting of a double layer of tongued and grooved boards, which have an insertion of cork insulation between. Cork is also used for insulation of the body generally. The interior panelling, from floor to cantrail, is of Bonply birch sheets, and the ceilings are of Sundeala. Interior decoration is of Rexine, and this, together with the final painting and varnishing, will be applied after delivery in Malaya.

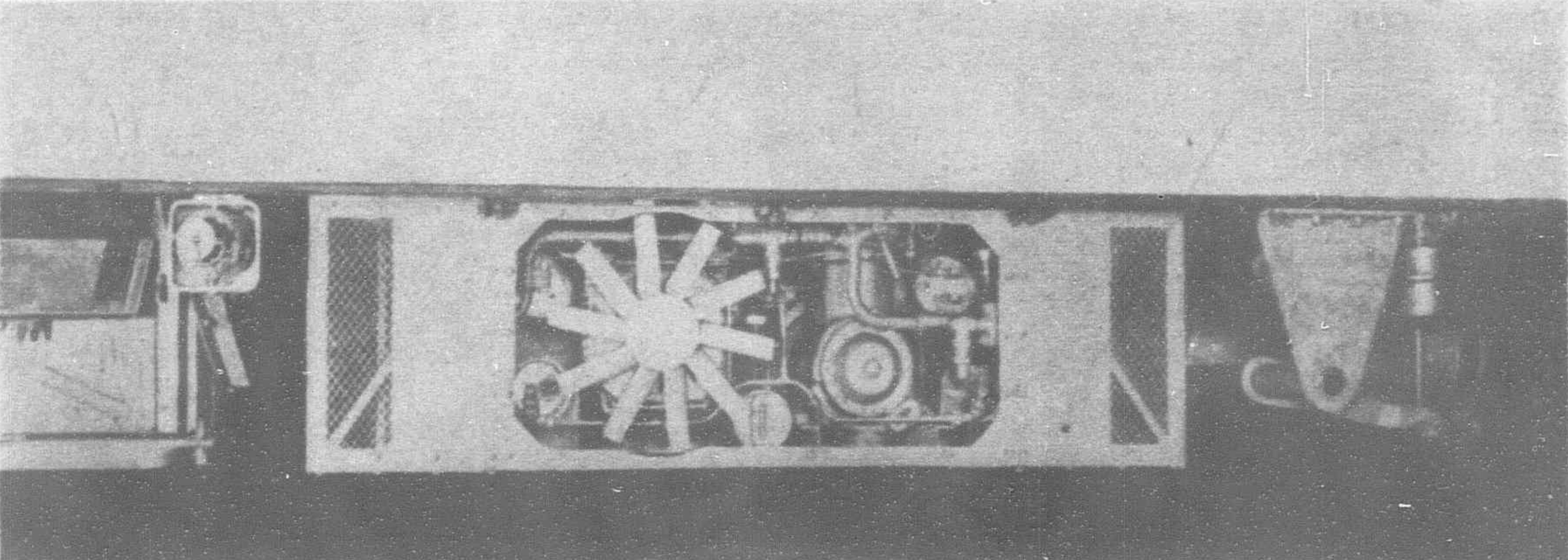
The layout of each coach comprises two large open saloons which respectively accommodate twelve and eight passengers, a small four passenger compartment, and lavatory. Entrance to the coach is by means of vestibules at either end. The chairs and tables are being fitted in Malaya by the Railway Company.

In the construction of the body, double lights are provided at each window opening. These lights are normally fixed, but the inner lights are fitted with budget locks, so arranged that they can be easily removed to clean the glass. In addition, several of the exterior windows are arranged so that they can be hinged inwards for ventilation if occasion demands. Roller blinds in "Pantasote" are provided at each window. All the electric lighting fittings

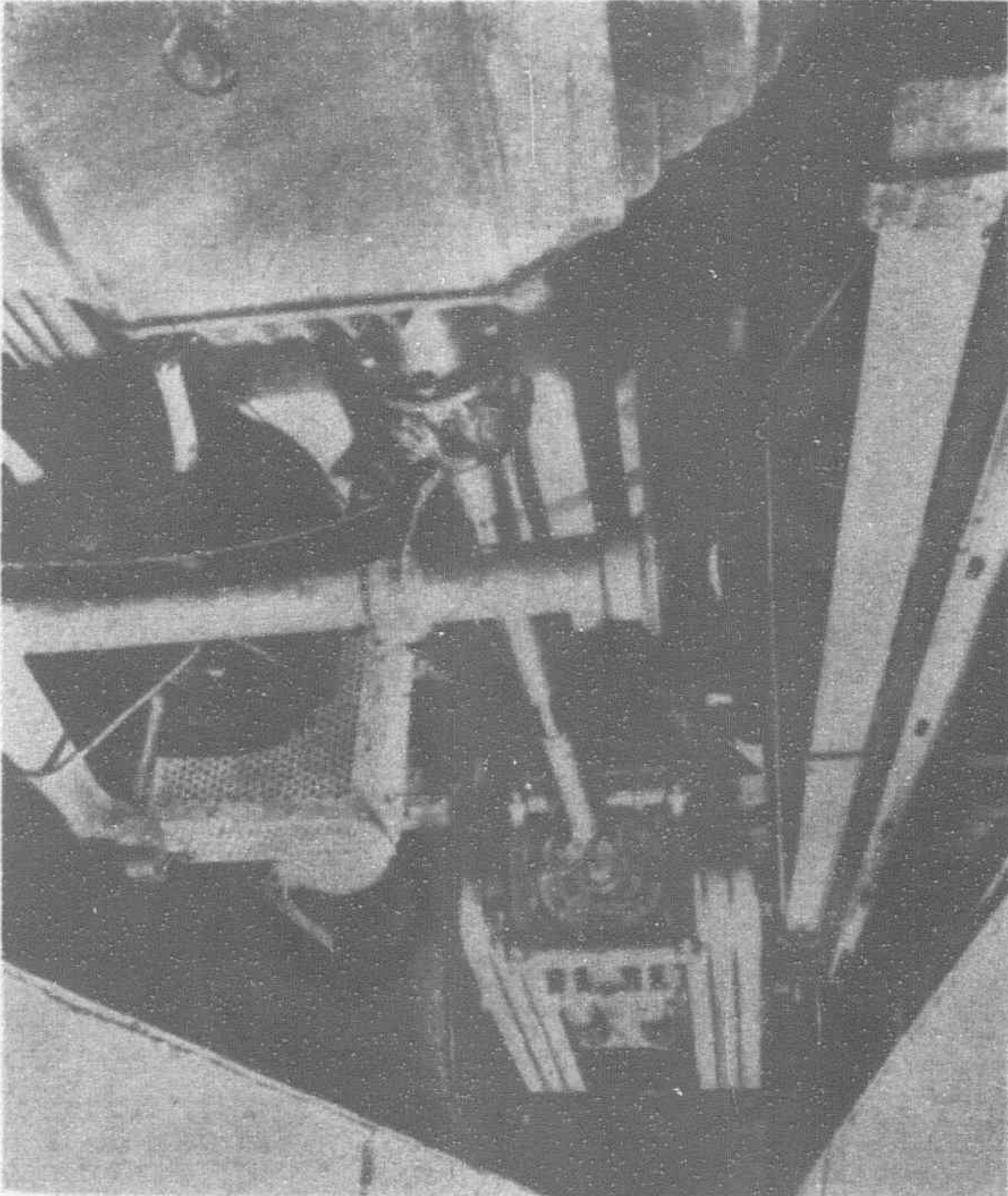
*Eastern Engineering and Commerce.



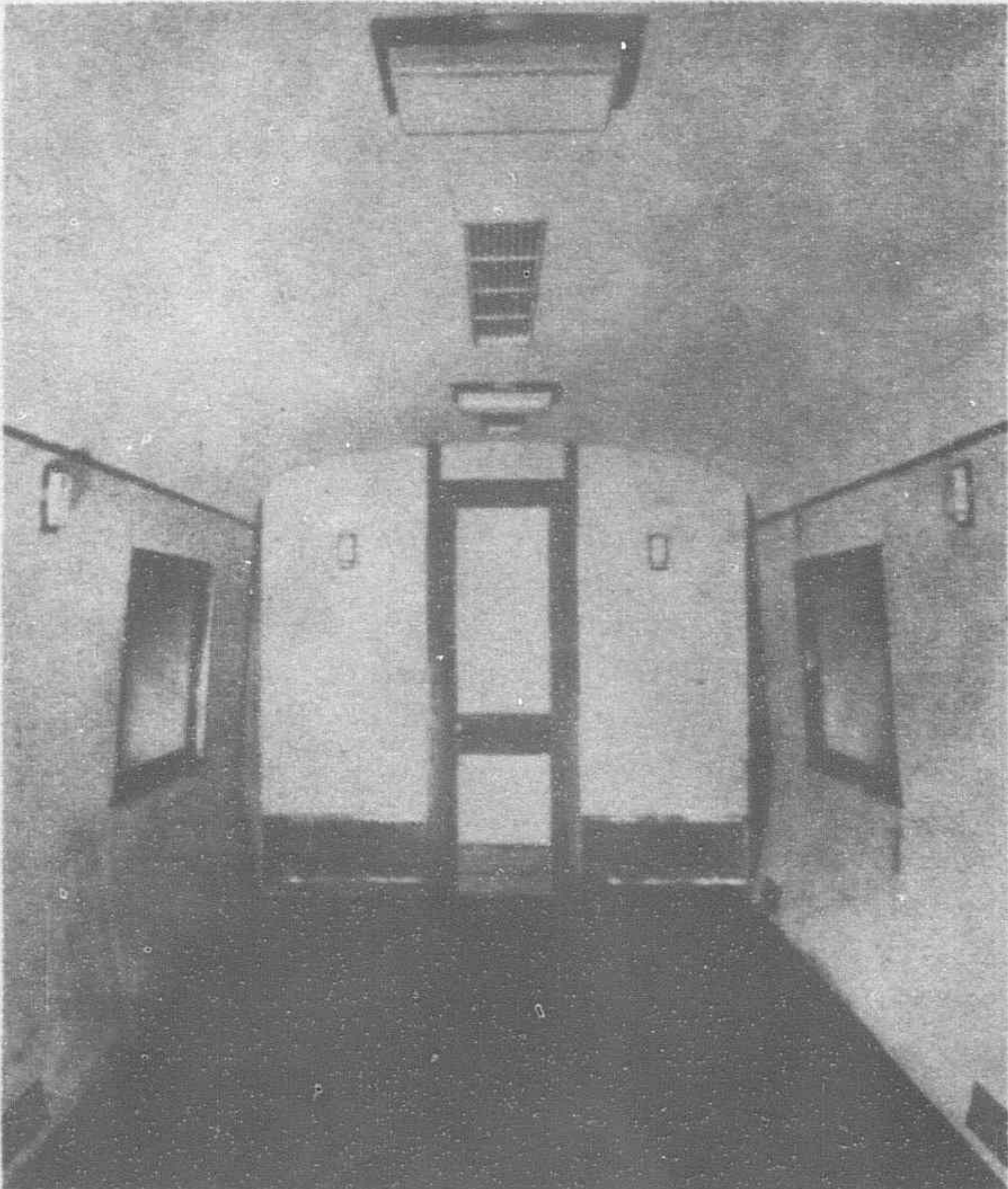
One of the new F. M. S. Railway Coaches with Underframe Refrigerating Unit



The Underframe Refrigerating Unit with Cover Removed



Underview, showing Telescopic Propeller shaft



Interior of Saloon of one of the New Coaches

have been supplied by Messrs. J. Stone & Co., Ltd., and are of the new "Luxton" type with opal non-glare glassware. The current for these is taken from the generator and battery which forms part of the air conditioning plant. Automatic vacuum brake is fitted, having two "Prestall" cylinders, and passenger alarm signal discs of the Railway Company's standard are fitted in the saloons. The bogies are of the equalizing beam type, bolster springs being of the quadruple elliptical type, and the side springs of triple coil type. Hyatt roller bearing axleboxes are fitted.

Air-Conditioning Equipment

The air-conditioning equipment is designed to provide an ample supply of fresh air, free from dust, for the twenty-four passengers; to maintain automatically the correct temperature and degree of humidity inside the compartments; and to give comfortable travelling conditions, without draughts, at all seasons of the year in Malaya.

The following comprises the equipment: Axle gear drive for the generator, generator, storage battery, refrigerating unit, air conditioning unit with evaporator, control panel, ducting for air distribution, pre-cooling motor, and plugs and sockets for external supply when pre-cooling.

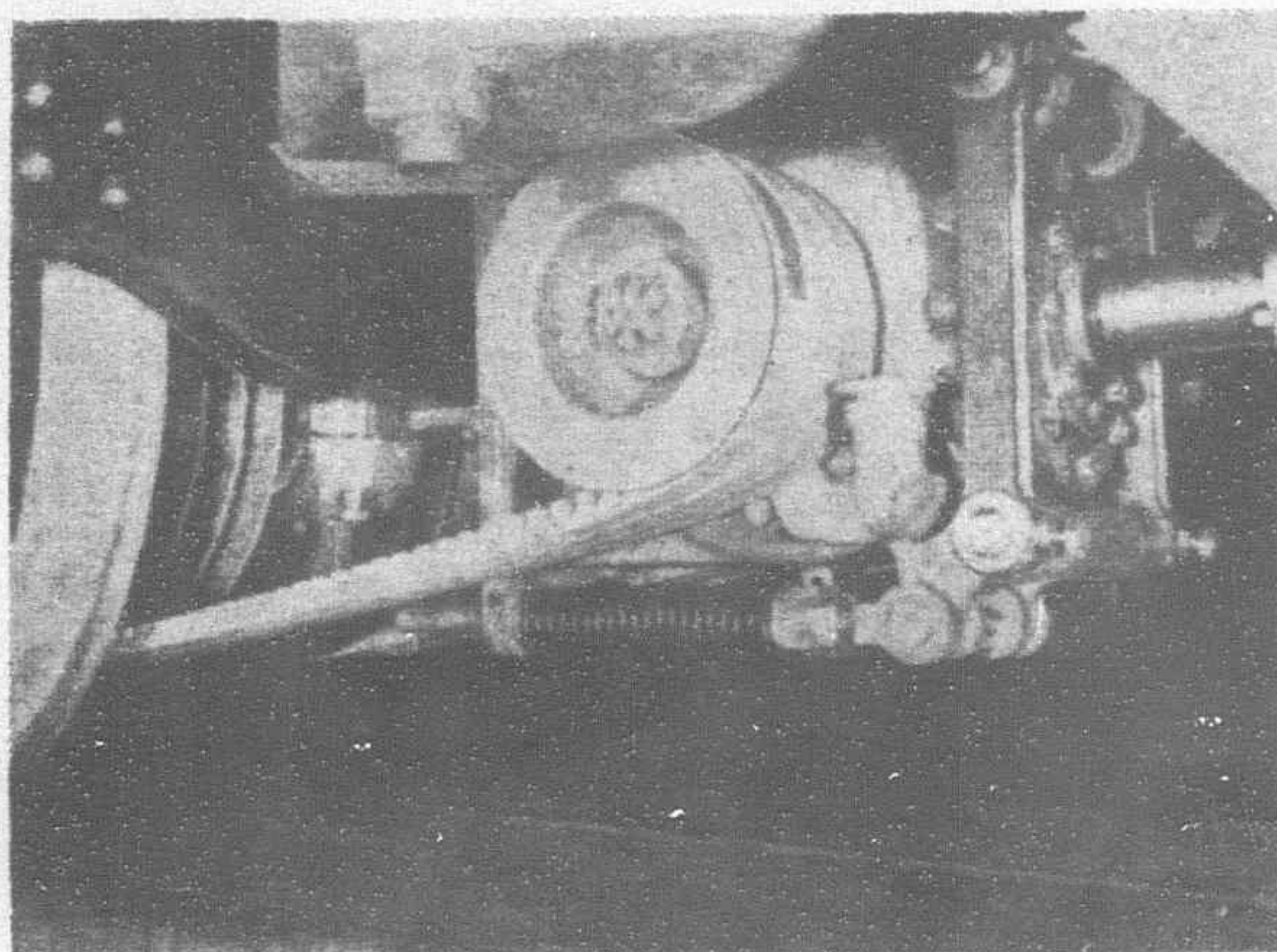
The fresh air drawn through louvres in the vestibule doors passes up through a grille in the vestibule ceiling and after the dust and dirt have been extracted by passing through viscous oil filters it passes over the cooling coils of the evaporator where a proportion of the moisture in the air condenses on the cold surface and at the same time temperature is reduced to the required level according to the setting of the thermostatic control.

The air is then drawn into the twin centrifugal fans and forced through ducts situated in the double roof, finally passing into the compartments through grilles which give even distribution without draughts throughout the vehicle.

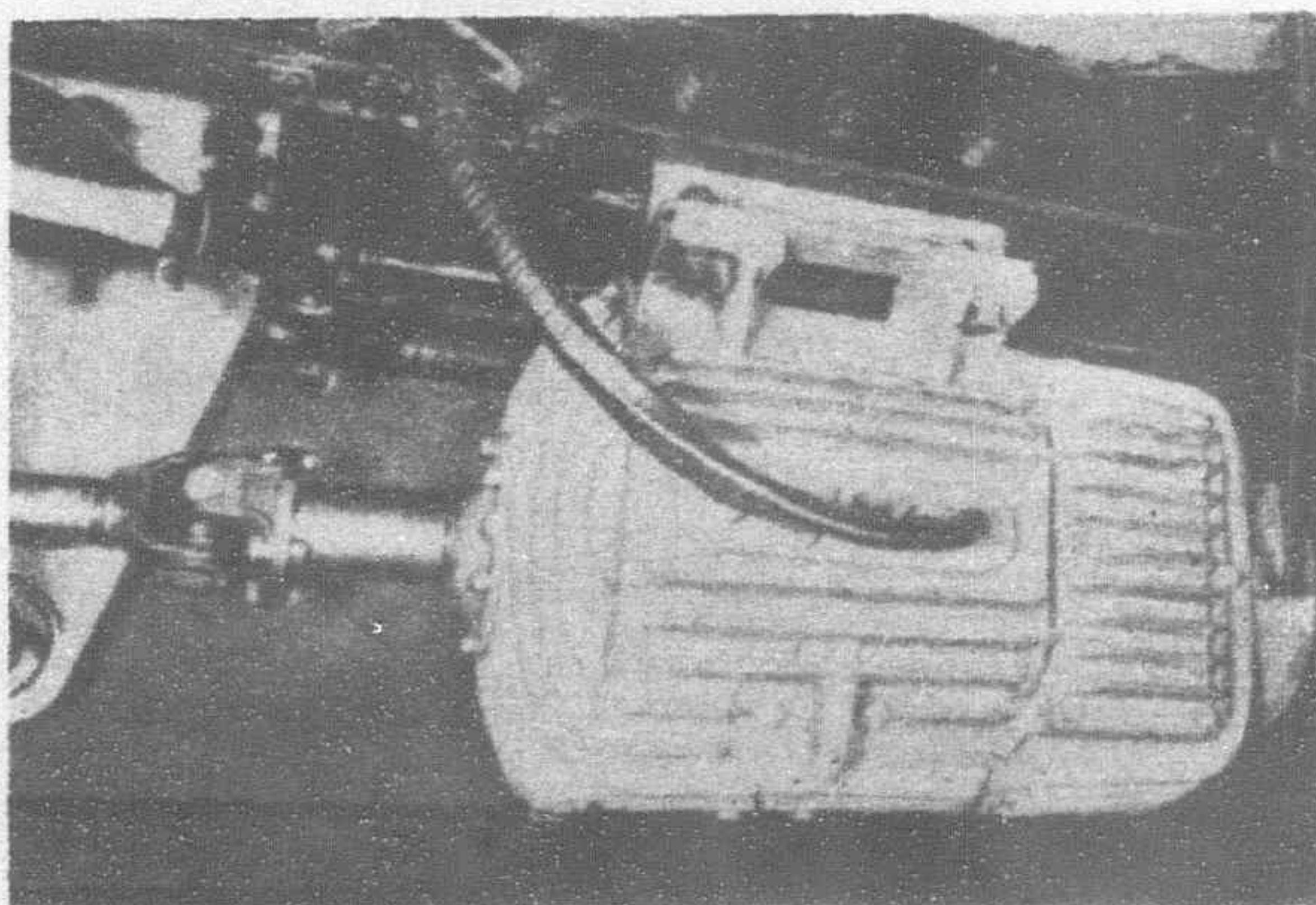
A portion of the air escapes to atmosphere owing to the slight pressure produced by the centrifugal fans and the remainder returns through grilles in partitions at floor level to the vestibule end and then through vertical ducts up to the roof to be recirculated.

The refrigerating unit and the evaporator operate on the normal compression system using as the refrigerant "Freon" (Dichlorodifluoromethane), which is non-toxic, non-irritant and non-inflammable. The Freon is circulated throughout the closed circuit by the compressor and passes from the liquid receiver through a small orifice in the expansion valve and then to the evaporator coil. Since the evaporator coil is connected to the suction side of the compressor, there is a reduced pressure in the evaporator and liquid Freon passing into it vaporises into a gas. In changing its state from a liquid to a gas it absorbs heat from the air passing over the coils.

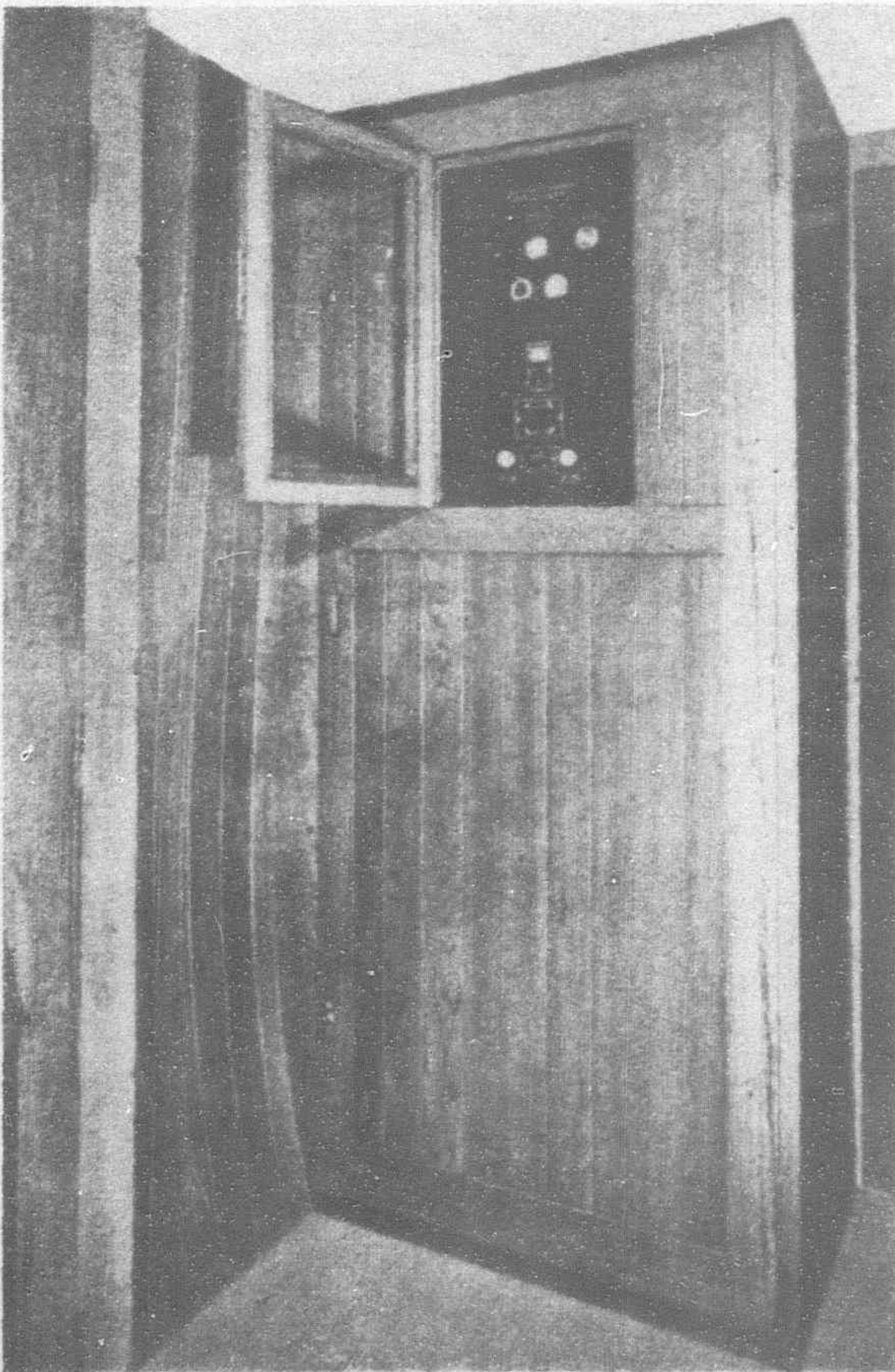
The gas is drawn into the compressor and compressed, which operation raises its temperature. The hot compressed gas then passes into the condenser coils,



Generator Gear Drive from Axle



The totally enclosed "Tonum-type" Generator



The Control Panel

when the heat extracted from the air in the car, plus the work converted into heat when the gas is compressed, is transferred to a continuous stream of atmospheric air which is passed over the condenser coils. The compression of the gas causes it to condense into a liquid which is collected in the liquid receiver, thus completing the cycle.

The axle-driven generator supplies the power for driving the compressor and circulating fans for air conditioning as well as the lighting and battery charging, thus making the whole plant self-contained and not dependent on any other carriage or the locomotive.

The pre-cooling motor enables the plant to be run from an external supply at terminal stations when required to pre-cool the vehicle or in emergency to charge the batteries.

It will be seen from the disposition of the various details of the air conditioning equipment that there is no reduction of passenger accommodation.

The air conditioning unit with evaporator and the ducting is situated in the roof, the control switchgear in a cupboard in the vestibule and all the rest of the apparatus is suitably placed on the underframe.

Detailed Description

The generator gear drive from the axle is by means of Vee belts to a gear box suspended on the bogie headstock. There are two axle pulleys each having three Vee belts, and the gear box is carried on four suspension links attached to the bogie headstock. The links permit the correct tensioning of the belts by means of springs. The gear box contains a pair of spiral bevel wheels running in oil. The crown wheel shaft carries the two belt pulleys and the pinion shaft carries the coupling for the propeller shaft. The generator is driven from the gear box by means of a telescopic propeller shaft fitted with a universal joint at each end. This form of axle gear drive is very robust, quiet in operation and flexible in application.

The "Tonum" type generator operates efficiently over a wide range of speed. It is totally enclosed, dust and watertight. The generator is provided with large inspection covers in the commutator end shield to permit easy access to the brushgear. The brushes are fixed in position and reversal of rotation is compensated for electrically.

The pre-cooling motor is of normal design for working on an A.C. supply at 400-volts 3-phase 50-cycles.

The storage battery is composed of Stone's "No Wash" cells which are specially light in weight and require the minimum of attention. The battery has a capacity of 520 ampere hours at 48-volts. The power for the air conditioning equipment is taken from the generator and battery at 48-volts, but the lighting load is divided on the three-wire system so that standard 24-volts train-lighting lamps and fittings can be used.

The control panel is divided into two distinct sections. The master control switches operated by the attendant for

(Continued on page 39)

Power Development in Russia*

The contribution of the Russian delegation to the recent World Power Conference, instead of individual papers, was a 500 page book giving a comprehensive review of the fuel situation, power developments and electrification systems as definitely planned and now being carried out in that country. With decentralization of the fuel industry the use of local fuels is being promoted and the experience in burning the various low-grade fuels is related in detail. All power equipment for new stations is now being built in Russia and both boiler and turbine units are being standardized. The progress in station capacity, the employment of large units and high pressures to date far exceeds the prevailing distant conception of what has been going on, as will be apparent from the accompanying brief review.

* * *

At the beginning of 1926 the aggregate installed capacity of Russian power stations was 6,880,000 kw., or 6.3 times that of the pre-war level and three times that at the beginning of 1929. Even more rapid has been the electrical output which rose to a total of nearly 26 billion kilowatt-hours in 1935, which was 13 times that of the pre-war level and 5.2 times that of 1928.

In 1928 there was not a single station having a capacity of 100,000 kw. or more, the first one of this size being the Shatura, placed in service in 1930. However, by 1935 there were seventeen stations of such capacity or greater, among them seven of more than 150,000 kw. each.

There are six principal power systems supplying Soviet Russia, namely, the Moscow, Leningrad, Donetz Basin, Dnieper, Urals and Gorki-Ivanovo. These employ high-voltage networks ranging from 22,000 to 220,000-volts.

The Moscow System is supplied by four stations, namely, the Kashire of 186,000 kw., the Shatura of 180,000 kw., the First Moscow of 120,000 kw. and the Stalinogorsk of 100,000 kw. The three stations operating on the Leningrad System are the Red October of 111,000 kw., the Dubrovka of 100,000 kw. and the Lower Svir of 100,000 kw. Two stations, the Shterovka of 152,000 kw. and the Zuyerk of 200,000 kw. feed the Donetz Basin System. The Dnieper System is supplied by the 372,000 kw. Dnieper hydro plant. The Urals System has two stations, the Chelyabinsk of 126,000 kw. and the Berezniski of 105,000 kw. The Gorki Station of 204,000 kw. feeds the Gorki-Ivanovo System, and the Baku region is supplied by the Red Star Station of 109,000 kw.

Incidentally, the Kashira Station has five boilers, each of 423,000 lb. per hr. capacity, which rank among the largest in Europe.

The largest turbine units now in operation in any of these stations are 50,000 kw. and the ratio of boilers to turbine units is two to one, or less in the later stations. The trend is toward higher steam pressures and temperatures, 850 lb. being common and one station in Moscow having three large units operating at 1,850 lb. gauge. Furthermore, many of the later stations are laid out to supply both power and steam for process and heating.

Fuel Supply Decentralized

While Russia has abundant resources of coal, oil and peat, widely distributed throughout the country, the mining industry in old Russia centered within the Donetz Basin where the better grades of coal abounded. In fact, 89 per cent of the total coal output in 1913 came from this region; and 92 per cent of the oil from the Caucasian district. However, as these regions were remote from the major industrial centers, long rail haul was necessary and the average mileage far exceeded that of all other classes of freight; in other words, fuel shipments represented over 33 per cent of all freight handled.

Under the present plan of decentralized fuel supply, the aim is to utilize local coals to the fullest extent possible. While many of these coals are of inferior grade, it is claimed that the slightly lessened efficiency and the necessary measures adopted for their burning are more than offset by the decreased freight, and, furthermore, that industrialization of heretofore economically backward areas is promoted. Under this plan the 1935 output exceeded that of 1932 by 42.7 per cent.

The development of local fuel deposits, which in many cases consist of low-grade, high-ash coal, was feasible only through the construction of large regional power stations designed especially to burn the local fuels, and much experimentation was at first necessary.

Much difficulty was encountered in developing methods of successfully firing these fuels owing to their high moisture, ash and sulphur content, and to the low fusing temperature of the ash. Pulverization was found most applicable in the majority of cases, but this required the selection of the proper system of pulverizing, the development of drying methods, the design of new types of furnaces, special means for handling the large quantities of ash and removal of the sulphur from the stack gases.

Utilization of Peat

Of all the local low-grade fuels, peat occupies a special position in the power economy of Russia. The aggregate capacity of peat-fired regional stations at present is 868,000 kw. with an output of over four billion kilowatt-hours in 1935. This peat has a moisture content of 25 to 40 per cent, as fired, contains 4 to 15 per cent ash and has a heating value ranging from 2,790 to 6,660 B.T.U. per lb. Deformation of the ash begins at 1,895° F and fusion at 2,100° F.

Lump peat is fired on chain-grate stokers and fed through a vertical shaft through which preheated air is forced for preliminary drying. Water-cooled walls are widely used and boiler efficiencies up to 88 per cent are said to have been obtained.

However, during the past five years the production of milled peat has been steadily increasing, it being cheaper to extract peat by the milling process than by any other method. At first, milled peat was fired along with lump peat by employing special feeders, the milled peat being fired directly into the furnace above the lump peat on the stoker; but it was found that incomplete combustion and high stack losses resulted. Therefore, the milled peat is now being burned in suspension with very satisfactory results. With an initial moisture content of 40 to 55 per cent, evaporation up to 10.14 lb. per sq. ft. of heating surface is being obtained.

Anthracite Culm

This is burned largely in pulverized form and very fine grinding is essential. Several stations were equipped with the storage system and others with the unit system; but experience favors the former, as it insures higher milling efficiency, greater flexibility, less wear on the pulverizing parts and exhausters and easier regulation. The anthracite culm, which ranges from 2.5 to 6.5 per cent volatile, is burned in completely water-cooled furnaces with the water-wall tubes covered with refractory substance in the region where the coal stream enters the furnace. The turbulent type of burner has given the best results and the temperature of the preheated air must be high, in the neighborhood of 750° F. The fineness has now been standardized as 99 per cent through a 75-mesh screen and 90 per cent through a 180-mesh screen.

Moscow Coal

Moscow brown coal, which runs 30 to 35 per cent moisture, 20 to 38 per cent ash, 3.2 to 6.6 sulphur, and has a heating value of 4,340 to 5,364 B.T.U. per lb., contains a large amount of pyrites which makes it harder to pulverize and lowers the fusion temperature of the ash. This coal is therefore first prepared by separating out the pyrites, after which it pulverizes easily; but the high moisture content necessitates preliminary drying ahead of the mill. The drying is effected with the coal in suspension in drier pipes, the coal entering the drier being conveyed by an exhaustor directly to a cyclone chamber from which it is fed to the mill. The temperature of the drying air varies from 930 to 1,020° F and the velocity of the mixture is as high as 115-ft. per sec. This operation reduces the moisture to about 22 per cent which is satisfactory for

* Combustion.

pulverizing, although mill drying is further employed. The system requires about 25 kw.-hr. per ton of raw coal and the most suitable type of mill is the slow-speed ball type.

When the second section of the Kashira Station was built to burn Moscow coal, the 423,000 lb. per hr. boilers had water walls covered with cast-iron blocks. At heavy loads, intense slagging occurred, and this necessitated additional water-screening of the upper part of the furnace and the passing of cooling air through all unscreened firebrick areas. As a result of this experience, it has now become standard in later stations to equip the furnaces with plain water walls and water-cooled ashpits; also, to employ corner firing with tangential burners and to limit the temperature of the gases entering the first pass of the boiler to approximately 2,000°F.

Steam Power Equipment and Its Manufacture

The Soviet power stations built during the first Five-Year Plan were largely equipped with imported boilers, auxiliaries and turbine-generators. At the present time, however, all the later stations are supplied with equipment manufactured in Soviet plants and designed to meet the prevailing conditions. During the past year steam boilers with an aggregate heating surface of 3,230,000 sq. ft. will have been built, and the boiler industry began the manufacture of standardized boilers for medium pressure, namely, 483 lb. gauge and of the following sizes:

Pulverized coal	{	353,000 lb.—single-drum, sectional type
		265,000 lb.—double-drum, vertical type
		132,000 lb.—double-drum, vertical type
Oil-fired	{	88,000 lb.—single-drum, vertical type
		353,000 lb.—single-drum, vertical type
Stoker-fired	{	88,000 lb.—double-drum, vertical type
		44,000 lb.—double-drum, vertical type

Designs have been completed for new types of boilers which are to be placed in production in 1937 and which include a 353,000 lb. per hr. single-drum vertical boiler for pulverized coal to take the place of sectional-header boilers; a 530,000 lb. per hr. boiler; a 265,000 lb. per hr. boiler for burning milled peat; and stoker-fired boilers of 265,000 lb. and 132,000 lb. per hr.—all for steam pressures of 498 lb. per sq. in. The standardized pulverizing unit is the low-speed ball mill built in capacities of 8, 12 and 16 tons. These ratings are based on the use of anthracite culm and when used for Moscow coal the capacities are 50 per cent greater.

Soviet engineers are now faced with the task of introducing higher pressures and temperatures. In 1934 a 60,000 kw. installation for power and heating was placed in service at the Union Heat Engineering Institute. This is equipped with two Loeffler boilers, each rated a 331,000 lb. per hr. maximum at an operating pressure of 1,850 lb., and a third boiler of the straight-flow type, of Soviet manufacture, rated at 441,000 lb. maximum, 1,850 lb. pressure and

932°F steam temperature. Similar boilers of 551,000 lb. per hr. capacity are to be installed in the automobile plant at Gorki and in the new Chelyabinsk heating and power plant.

As in the case of boilers, the Soviet turbine manufacturing plants are now standardizing on turbine types and sizes. Up to now the condensing steam turbines produced in series were rated at 25,000 kw. and 3,000 rpm., and 50,000 kw. and 1,500 rpm. However, owing to the widespread development of stations for both power and heating service, new standards have been set up. During the present year 25,000 kw. bleeder turbines are being built in series production with steam extraction at 17 lb. abs for heating and at 100 lb. abs for process uses. A series of 50,000 kw., 1,500 rpm. condensing turbines is now being finished and a new design is being completed for a 50,000 kw., 3,000 rpm. machine. The Stalin turbine plant is turning out a 25,000 kw. high pressure turbine for an initial pressure of 1,705 lb. gauge and 495 lb. gauge back pressure. This plant will also turn out during the first six months of 1937 a 100,000 kw. 3,000 rpm. condensing turbine and 50,000 kw. bleeder turbines.

The engineering policy has fixed the following standard turbine types for manufacture in Soviet plants:

FOR POWER AND HEATING

Kilowatt rating						Bleeder outlet pressure, lb. per sq. in. abs.
50,000	..	..	..	..	..	17
50,000	..	..	..	..	..	100
25,000	..	..	..	..	..	17
25,000	..	..	..	..	..	100
12,000	..	..	..	..	..	17
4,000	..	..	..	..	..	17
2,500	..	..	..	..	..	17

FOR CONDENSING SERVICE

Kilowatt rating						Rpm.
100,000	..	..	..	..	..	3,000 and 1,500
50,000	..	..	..	..	..	3,000 and 1,500
25,000	..	..	..	..	..	3,000 and 1,500
12,000	..	..	..	..	..	3,000 and 1,500

Hydro Developments

The present installed capacity of hydroelectric stations is 482,000 kw. which includes the huge Dnieper development of 372,000 kw. (558,000 kw. ultimate). The ratio of the output of hydro to total power in Russia is increasing. In 1932 this ratio was 7.3 per cent with the plan calling for 19.5 per cent by the end of 1937.

PEGU YOMAH WATER SUPPLY SCHEME

The Government of India have sanctioned the application of the Municipal Corporation of Rangoon to raise a loan of Rs. 1½ crores (Rs. 1,50,00,000) to finance the Pegu Yomah water scheme which, it has been estimated, will cost about two crores. Thus another landmark has been reached in the progress of the City of Rangoon, for with the Pegu water supply scheme an accomplished fact, there will be no need for the acute anxiety which has been manifest during each dry season for the past ten to fifteen years. The completion of the scheme will remove all thoughts of a water famine, and will provide such an abundant supply of pure water that the whole of Rangoon will be supplied, and two important amenities provided for, firstly the cleansing of drains and back drainage spaces and the prevention of overcrowding at stand pipes and secondly, the removal of the fire menace, for at present it is only at night that there is an adequate pressure for fire-fighting purposes at the various hydrants, while in certain areas in the city there are no hydrants at all.

The City of Rangoon has grown steadily during the last half century, and at present occupies an important place as the capital and principal port through which the major part of the trade of Burma passes. Its development has been remarkable even during

the period of trade depression; and the area within Municipal limits has increased from 17 sq. miles to 32 sq. miles, while the resident population has risen from 210,000 to over 400,000. The financial position of the Municipal Corporation of the City of Rangoon is such, that present revenues are sufficient to meet the interest charges both on this and all existing loans without increased taxation. The City of Rangoon Municipal Act provides that due provision for repayment of loans shall be a first charge upon the Municipal Fund—the annual Loan charges payable on all the Municipal Loans (including to present issue) with amount to Rs. 23,18,613; and the annual average Municipal Fund Revenue of the past three years is Rs. 89,51,700.

The Loan charges, i.e., interest and loan repayment charges on all other loans and on the present issue are, therefore, covered nearly four times over without resort to increased taxation. Rates of property taxes have remained unaltered for over 20 years. During the current year, two loans amounting in all to Rs. 9,14,000 have been repaid, and Rangoon Municipal Debentures amounting to Rs. 28,15,500 previously purchased in the open market have been cancelled.

Russian Gold Industry

THE Soviet Government has decided to increase Russian gold production by 1939 to above 10,000,000 ozs. Their program is to raise the output of 1933 four times.

It is an undeniable fact that during the last years the Soviet Gold Trust sharply increased gold mining in Russia. But no official returns of production have been published in the Soviet Press, which gives only the percentage of increase. Comparing, however, various foreign sources one can see that gold production in U.S.S.R. rose from about 1,250,000 ozs. in 1930 to about 2,700,000 ozs. in 1933, to about 4,200,000 last year, and it seems very probable that this year production is between five and five-and-a-half million ounces.

As a matter of fact, these figures are not very interesting and essential for the understanding of the present position of gold mining in U.S.S.R. If even real gold output differs a little from these figures (accepted by the most authoritative European and American statistical institutions), it can at any moment reach and surpass these figures.

Further extension of gold mining in U.S.S.R. is limited or slowed down only by shortage of labor; that is the main fact of the situation.

Russian gold resources are very great and during the last years the Soviet authorities have done much in prospecting new fields. According to Serebrovsky, the Chief Director of the Soviet Gold Trust, the known gold resources of the Soviet Union belonging to "group A" in consequence of very active prospecting rose lately seven times. He claims that Russia is the wealthiest country in gold resources.

Furthermore, no commercial considerations exist for the Soviet Government in gold mining. Under present Russian financial and economic conditions, however low the gold grade, exploitation is profitable, because the greater part of the working expenses is met either in depreciated money or in products taken from the population in form of taxes and distributed among those who work for the Government. Even an annual yield of under ten ounces per worker would be very profitable to the employers, that is, to the Soviet Government.

Under such conditions further increase of gold production in U.S.S.R. depends only on attracting new hands to gold minings. This, however, is not an easy task, as living conditions in the majority of goldfields are very bad; Russian workers prefer to look for a job in the large industrial towns where food situation is comparatively better.

"Labor problem limits our gold production," the leaders of the Soviet gold mining frequently say. And their chief attention is attracted to this problem; the Soviet gold mining journal contains long agricultural articles about pig growing or cabbage plantations in the far northern goldfields.

Since last May, Serebrovsky has issued one instruction after another to mines managers, urging them to improve food supply to the mines and threatening with severe punishment those who would not carry out his orders. In one of the last instructions he complains that in the Urals private prospectors, who are greatly favored by the authorities, had to wait for hours in queues before getting food and other commodities from the Soviet agents in exchange for gold. Besides this, in order to carry out the production program of the year, Serebrovsky suppressed all leave to the miners and engineers, and increased the working day of the miners by two hours. The managers have been instructed to stop all works not directly connected with the production of this year—e.g., house and road construction, and to send all men engaged in these works into mining. The managers have been also advised to avail themselves of the labor of the members of the miners and mines' employees by employing them at mines.

According to Serebrovsky, there are at present several thousand "gold producing points" in the U.S.S.R. The great majority of them are, of course, in Asiatic Russia. Some of them are small placers where a hundred or so prospectors are engaged; others are great modern enterprise, sometimes with 10 or even 15 thousand workers. The exact number of workers engaged in the Russian gold mining is unknown. Last spring it was over 450,000.

In an article recently published in the Moscow newspaper *Za Industriaziu*, Serebrovsky says that at present 100 dredges, 85 great plants and 200 hydraulic installations are at work in the Soviet gold mining industry. Some of the new installations are able to mill daily up to 1,000 tons of ore. Serebrovsky says that the Soviet metal industry is able to supply further mechanical equipment to the mines. Further on, he boasts that now about 78 per cent of mining is mechanized. This figure seems open to much doubt. But even if this be correct, what is the use of mechanization if, for instance, in the Urals, according to Serebrovsky, from 32 to 40 per cent of the precious metal remains in the ground, unextracted.

In order to carry out the great extension of gold production envisaged by the Government, Serebrovsky says that mining will be soon started in quite new districts of the Far East, the Lena region, Western Siberia, and Central Asia.

Malayan Railways Air-Conditioned

(Continued from page 36)

starting the equipment and for temperature control are mounted together in the upper section and exposed to view through a glass window in the cupboard situated in the vestibule.

The contactor switches, fuses, terminals, etc., are mounted in the lower section and are fully accessible when the cupboard door is open.

The refrigerating unit mounted on the underframe contains a twin cylinder vertical single acting compressor, driven by an electric motor, the condenser with fans for directing the air through the coils and the liquid receiver. The pre-cooling motor is mounted alongside and is connected to the compressor by a propeller shaft with universal joints.

The air conditioning unit is situated above the vestibule ceiling and contains the evaporator, the two centrifugal fans driven by an electric motor, the expansion valve and the viscous oil air filters.

Extension of Railway Tunnel

The Railway Office originally planned to extend the tunnel across the straits from Tanokubi to midway between Dairi and Shinmachi, but because of the opposition of Moji, due to the fact that the terminal would be six kilometers from the center of the city, the office decided to reinvestigate.

At present, two courses are suggested. Moji proposes a course between Deshimachi and Komorie, while the engineering bureau of the Railway Office wants the route to start from Deshimachi and end some 500 meters from Ipponmatsu. Boring is now going on along the route suggested by Moji to decide the practicability of the course.

The construction project proper, which calls for an appropriation of some Y.18,000,000 on a four-year program, will commence in the next fiscal year. The so-called shield system will be adopted. The cost of pushing the bore under the sea will range from Y.500 to Y.6,000 per meter in accordance with the strata.

Experimental bores will be made at 15 different places along the Moji route. Two have already been completed. A giant structure for boring now stands in the center of the Oseto Straits, some 50 feet deep, where the current rushes at the rate of eight nautical miles per hour and where numerous vessels pass.

The boring apparatus weighs 450 tons and measures 70 feet in height. It is sunk by flooding four air tanks below. When the boring is completed at one place, it is towed to another place after it is refloated by pumping air into the tanks.

In the tunnel construction, the workers will labor under high pressure, and no laborers over 40 years of age will be employed. According to the plan, the working time will be limited to 30 minutes per shift, after which three hours' rest will be given. Granting that the working time per day per laborer is eight hours, he will actually be under the sea only one hour per day.

Fast New Ships for North German Lloyd's Service to Far East

By Dipl.-Ing. E. BERENDT VDI, Berlin

FOR fifty years, the North German Lloyd of Bremen has been maintaining a steamer service between Europe and the countries of the Far East. To the end of shortening the travel times on this route, two new twin-screw express steamers, the *Scharnhorst* and *Potsdam*, were put into commission last year in May and July, respectively, while a further vessel, the *Gneisenau*, went into service last December. In their principal dimensions, equipment, and speeds, these three ships generally agree. With the completion of the *Gneisenau*, therefore, a fleet of three equivalent steamers will be available and will permit a ship to start on the going or return run once every four weeks. Instead of taking fifty-two days as hitherto, the journey from Europe to the Far Eastern ports now requires but thirty-four days, while the stretch between Genoa and Shanghai, which is the one of the largest importance for passenger service, is negotiated in twenty-three days.

The principal data of this new class of ships are:—

Length, overall	.. .. .	198.73 m. (653-ft.)
Breadth	.. .. .	22.50 m. (73.8-ft.)
Draft	.. .. .	8.80 m. (28.9-ft.)
Effective engine output	.. .. .	2 x 13,000 h.p.
Speed	.. .. .	21 knots
Tonnage	.. .. .	18,300 B.R.T.
First class accommodation	.. .. .	for 142 passengers
Tourist class accommodation	.. .. .	for 150 passengers
Crew	.. .. .	265
Total capacity of holds about	.. .. .	14,000 cu.m. (500,000 cu.ft.)

But it is not only their high speed which distinguishes the new ships. In their design, particular consideration was accorded to the fact that they are required to navigate both the cold zones of the North and the tropical seas, and that it is therefore essential to offer the passengers accommodation in the way of rooms and appointments which render the pronounced change in climate as tolerable as it is at all feasible to make it. As will be seen from the following, nothing has been left undone to realize this aim.

Passenger Accommodation

First Class.—The cabins of the first class are all disposed along the external walls of the ships and are therefore both airy and light. They are all equipped with hot and cold running water, and for the most part have private shower baths and toilets. Tub and shower baths for general use take care of the needs of the remaining passengers.

The requirements of the most fastidious travellers are met by four *de-luxe* suites, the general arrangement and appointments of which can be seen from the accompanying illustrations.

The social and public rooms of the first class comprise the assembly hall,

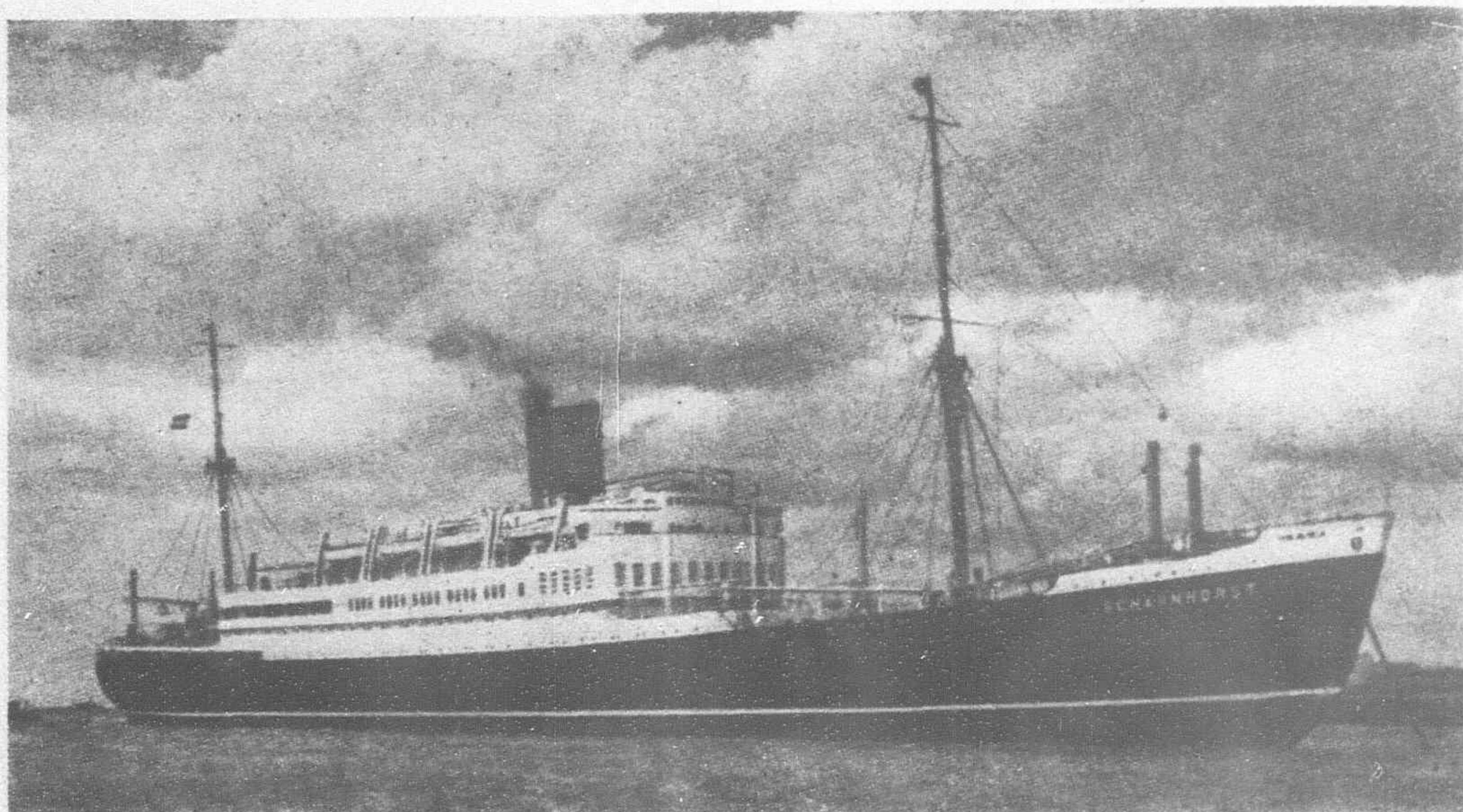


Fig. 1—The North German Lloyd's fast liner s.s. "Scharnhorst"

dining-room, smoking saloon and writing and reading-rooms; ladies' saloon; children's dining and play room; gymnasium; sports, recreation, and promenade decks; and open-air swimming bath. All of the rooms are ornamented with paintings and wood carvings by noted German artists.

The largest and most beautiful room of the entire ship is the first class assembly hall. It is 4.5 m. (14.7-ft.) high and spans the entire width of the vessel. Numerous high windows give a view upon the sea on three sides. Luxurious equipment and appointments render the stay on the vessel comfortable and agreeable to the passengers.

Tourist Class.—With the provision of a tourist class on the new express steamers, a new feature has been introduced into the German Far-East service, for no such class was hitherto carried. Also in this class, the cabins are comfortable and are fitted and equipped as required by the conditions of a journey through the tropics. Provision is made for running hot and cold water, while an ample number of tub and shower baths are available for general use.

The social and public rooms comprise a social hall, dining saloon, reading saloon, children's play room, open air swimming bath, and sports, play, and promenade decks. In their equipment and appointments, these rooms are hardly second to those of the first class.

General Arrangements.—Serving the purposes of the amusement of the passengers are moving-picture plays, society games, and sports and pastimes under the supervision of sports teachers and swimming masters. Radio transmission and music for entertainment and dancing is provided for in the shape of a large radio and gramophone installation, which is connected to all social rooms and to the promenade deck.

All of the cabins and social rooms of both passenger classes are connected to an artificial ventilating system which continually supplies fresh cool air. In the cabins, the passengers are able to regulate the artificial air supply themselves.

Holds

For the carriage of freight, six large holds, of a total capacity of about 14,000 cu.m. (500,000 cu.ft.) are available in each ship. In addition, eight separate and independent tanks are provided for the transport of oil and other fluids.

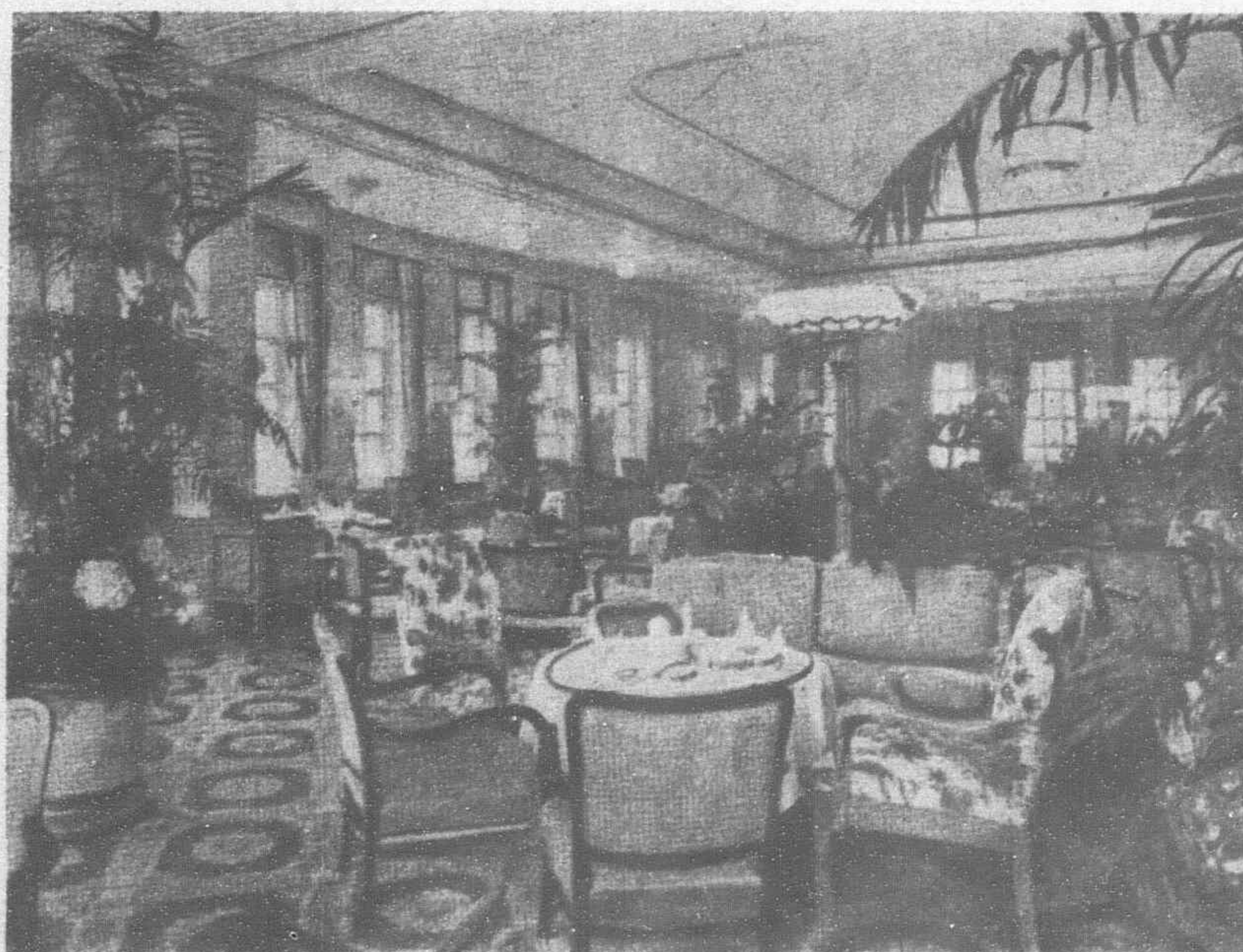


Fig. 2—First class assembly hall on the s.s. "Scharnhorst"



Fig. 4—The ladies' saloon, tourist class, s.s. "Scharnhorst"



Fig. 5—One of the cabins, tourist class on the s.s. "Scharnhorst"

For quickly loading and unloading the freight in port, each vessel is equipped with twenty-two crane booms of the usual size, and with one boom each of 25 tons and 50 tons capacity. All of the cranes are operated by electricity.

The journey through the tropics also renders it necessary to provide special cold-storage rooms. Some 1,400 to 1,500 cu.m. (50,000 to 60,000 cu.ft.) of freight space are cooled for the transportation of frozen products such as meat, as well as of fruit and similar products. In rooms serving for the storage of frozen goods, cooling is effected indirectly by the circulation of calcium-chloride solution through tube coils. In rooms for storage of fruit, on the other hand, a circulation of cooled air mixed with fresh air is maintained, in order to provide the necessary even temperature and to take care of the emanation of carbonic acid from the fruit.

The refrigerating equipment comprises three electrically driven vertical carbonic-acid compressors, each of 55 h.p. at 350 r.p.m. working in two stages and with intercooling.

Constructional Details

For determining the shape of the hull, extensive model tests were carried through by the Hamburgische Schiffbauversuchsanstalt. The owners were particularly concerned in finding a form of hull tending to damp as much as possible the pitching vibrations of the ship which are always particularly disagreeable to passengers. For the *Scharnhorst* and *Gneisenau*, it was decided to adopt a bow resembling the "Maier" shape.

Eleven transverse bulkheads divide each vessel into twelve watertight and fireproof compartments. A water fire-fighting system and a foam fire-quenching plant with numerous foam hydrants permit of rapidly and effectively suppressing any fire which might occur. When a fire is being signalled, all

ventilating motors are cut out from the bridge in order to prevent the introduction of air into the vessel and therewith any possible fanning action.

The s.s. *Scharnhorst* and the *Gneisenau* were built in the yards of the A. G. Weser der Deutschen Schiff-und Maschinenbau A. G., of Bremen. The order for the s.s. *Potsdam* was awarded to Blohm & Voss, of Hamburg. The *Scharnhorst* and *Potsdam* are the first German sea-going ships to receive turbo-electric drive, whereas the *Gneisenau* will be equipped with geared turbine drive. The entire turbo-electric plant of the *Scharnhorst* was built and installed by the Allgemeine Elektrizitäts-Gesellschaft, of Berlin, and that of the s.s. *Potsdam* by the Siemens-Schuckertwerke A. G., of Berlin.

The following firms supplied the main parts of the installations:—

Boiler Plant and Turbines:—

s.s. *Gneisenau*, Deutsche Schiff-und Maschinenbau A.G. Werk: Act.-Ges. "Weser"

Boiler Plant:—

s.s. *Potsdam*, Siemens-Schuckert, Berlin (Benson boiler)

Turbos-Electric Plant:—

s.s. *Scharnhorst*, A. E. G., Berlin

Refrigerating Plant:—

s.s. *Gneisenau* and *Scharnhorst*, Atlas Werke A.G.

s.s. *Potsdam*, A. Borsig Maschinenbau A. G.

Fire Signalling Plant:—

s.s. *Gneisenau* and *Scharnhorst*, A. E. G., Berlin

s.s. *Potsdam*, W. Iversen, Dinier & Co. Nachfolger.

Fire Extinguishing Plant:—

s.s. *Gneisenau* and *Scharnhorst* CO₂-Plant with Smoke-Alarm Installation, C. Walther & Cie.; Foam Plant for engine room, Minimax A. G., Berlin; Foam Plant for other parts of the vessels, Bergedorfer Eisenwerk A. G.

s.s. *Potsdam*: R. O. Meyer

Rudder Plant:—

s.s. *Gneisenau* and *Scharnhorst*, Atlas Werke A. G. (mechanical part); A. E. G., Berlin (electrical part)

s.s. *Potsdam*: Atlas Werke A. G. (mechanical part); Siemens-Schuckert, Berlin (electrical part)

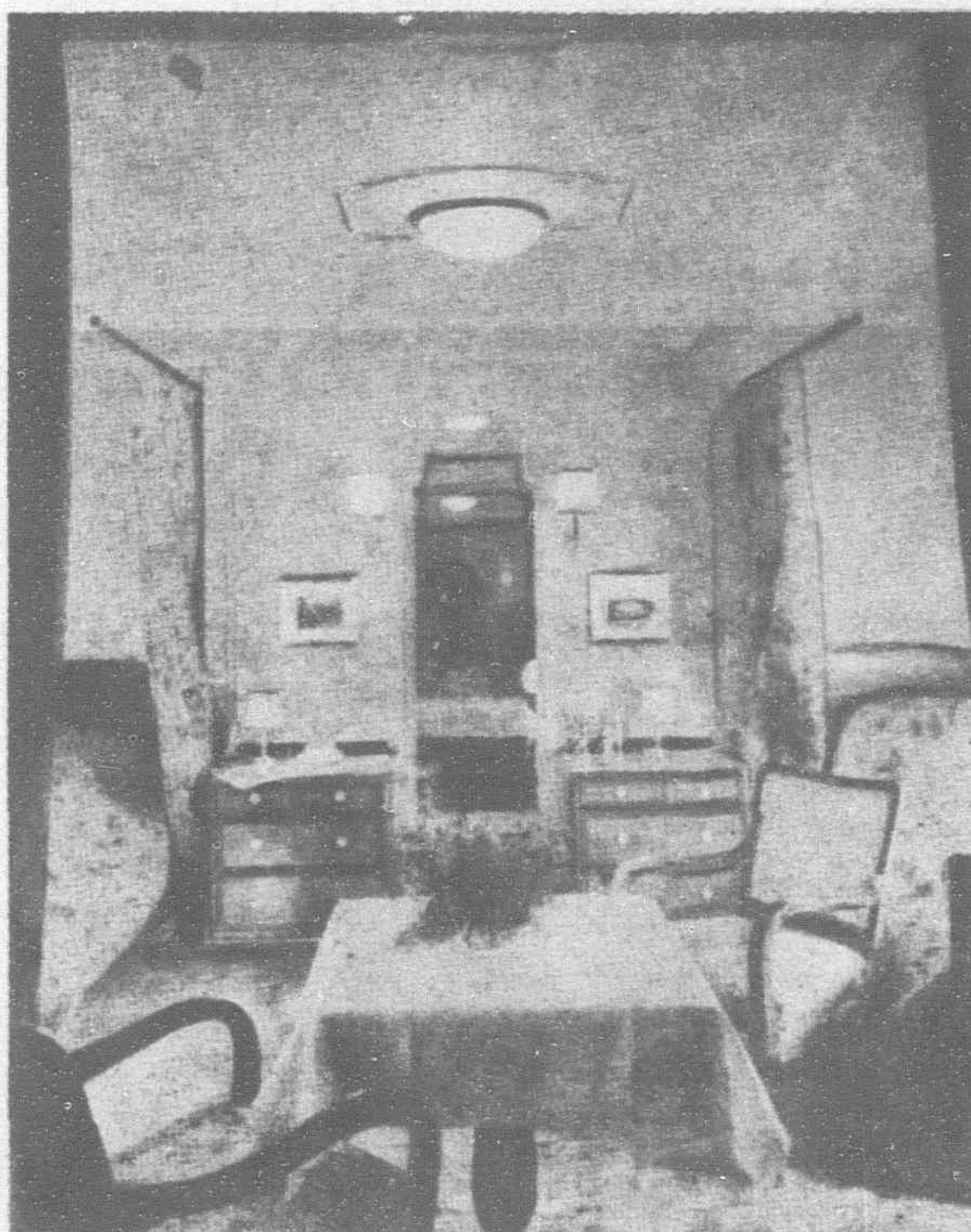


Fig. 3—One of the state rooms on the s.s. "Scharnhorst"

THE JAPANESE STEEL INDUSTRY

The Asano Shipbuilding Company's Iron Manufacturing Department will use heavy oil for new open hearths to be established next year. The company will erect a 300 ton blast furnace by March and with it two 50 ton open hearths and one refining furnace at a cost of some Y.1,500,000 by the end of next year. By the coming additional equipment, this company will double its big

iron productive capacity. The present scrap system will be replaced by the ore system. Investigations are now being made regarding imported ore.

Much caution is being exercised by the Japan Iron Manufacturing Company for investigations to choose proper sites for additional iron manufacturing plants.

Engineering Notes

RAILWAYS

A RAILWAY PROJECT.—Latest Chinese reports seem to indicate that the project of constructing a railway between Tientsin and Shihchiachwang has replaced the project for a railway connecting Tsangchow and the latter city. The Chinese authorities, it is understood, are discussing the terms of a contract to be concluded with the Japanese as regards the provision of capital and construction materials for the new line.

NEW TRAINS.—Four "Olympic" trains are to be built, at a cost of Y.3,000,000, by the Manchoukuo State Railways, according to tentative plans announced here. The trains, it is stated, are being ordered "in anticipation of a large influx of tourists from all parts of Europe to see the 1940 Olympic Games in Tokyo; and the World Exposition to be held there the same year in commemoration of the 2,600th anniversary of the founding of the Japanese Empire."

KWANGTUNG-FUKIEN RAILWAY.—The proposal for the construction of two railway lines connecting Kwangtung and Fukien provinces has been approved by General Yu Han-mou, Pacification Commissioner for Kwangtung, according to information received in Foochow. The proposal calls for the building of two railway lines between Chaochow and Changchow, and Chaochow and Changti, distances of 300 li and 400 li respectively. Both of the proposed lines will link up with the Chaochow-Swatow Railway, thus connecting Southwestern Fukien with the important seaport in East Kwangtung.

LUNG-HAI RAILWAY EXTENSION.—An appeal for the early extension of the Lung-Hai Railway from Paoki, Western Shensi, to Lanchow, provincial capital of Kansu, has been telegraphed to the Central authorities by the Kansu Provincial Party Headquarters. The message enumerates three reasons for the extension of the railway westwards. In the first place, construction of the railway by means of labor relief will serve indirectly to repatriate the refugees. Secondly, the rich mineral resources in Kansu necessitate the early completion of the line. Thirdly, the extension of the railway westwards to Lanchow will help in preventing the extension of reactionary influence and strengthen the northwestern defences.

INDUSTRIAL

ALUMINIUM WORKS.—Work is due to commence upon the construction of the new aluminium works of the South Manchuria Railway Co., which will cost 15 million yen and will be capable of an annual production capacity of 3,600 tons of aluminium.

JAPANESE RAYON OUTPUT.—Output of rayon by the members of the Japan Rayon Association, in the first six months of 1936, totalled the record amount of 120,090,300 lb., against 92,294,130 lb. in the corresponding period of 1935 and 64,367,610 lb. in 1934.

LIQUEFACTION PLANT.—Work is shortly to commence upon the projected liquefaction plant of the South Manchurian Railway Co., the cost of which has been estimated at 15 million yen. The process to be worked has been developed after eight years' collaboration between the company and the Japanese Marine Fuel Department.

NEW WATERWORKS IN SIAN.—Hardivilliers et Cie, representatives of French manufacturers in metals and machinery, with head office in Shanghai, has been awarded a \$626,000 contract to install a running water system in Sian, it was officially learned recently.

The contract, which was signed on August 20, stipulates that the whole project must be completed within 17 months. The water supply is to be drawn from artesian wells.

JAPANESE TIMBER MERGER.—Three leading Japanese lumber importers have formed a joint corporation with a capital of about £250,000 to deal in Canadian and American softwoods.

The new corporation is attempting to secure exclusive sales agencies from the leading North American exporters.

It is hoped that the elimination of duplication and the ability to purchase in bulk will result in substantial savings.

GINNING FACTORIES.—To meet the increasing demand for cotton ginning factories in Hunan, the Hunan branch of the Cotton Improvement Commission of the National Economic Council, has completed plans for the establishment of three factories in Changteh, Chengchow, and Taikong. Orders have been placed by the new factory in Changteh for one Diesel motor of 30 horse-power and 30 modern ginning machines of 32-in. When installed, these machines will be able to gin about 400,000 catties of cotton seeds in five months.

NEW OIL COMPANY.—It is reliably learned that the China Wood Oil Refinery Company, which held its organization meeting in Kuling recently will have its head office in Hankow, which is an important center of the tung oil trade.

COMMUNICATIONS

LOYANG-LINJU HIGHWAY.—Construction of the Loyang-Linju Highway in Western Honan has been completed at a cost of \$300,000. The road will form part of the Loyang-Shiuchow National Highway, extending from Honan province in the north to Kwangtung province in the south.

NEW HIGHWAY.—Arrangements for through transportation on the Highway between Szechuen and Shensi will not be completed until the end of the year, according to a communication from the Szechuen Highway Bureau to the Northwestern National Highway Bureau. The Sian-Ninkiang Highway, however, was opened to traffic recently.

HIGHWAY IN SHENSI.—The construction of the Hanchung-Ninkiang Highway in Southwestern Shensi, which was commenced last autumn has now been completed under the supervision of the Shensi Provincial Department of Reconstruction. The highway is 140 kilometers long and has been financed by the National Economic Council.

CANTON PLANS NEW HIGHWAY.—In pursuance to the instructions of General Chiang Kai-shek, President of the Military Affairs Commission, the Kwangtung Provincial Department of Reconstruction has decided to build a highway starting from Yanfa, about 65 miles north-east of Canton, which will pass through Sunfung (Chongning) and terminate at Yungyun, northern Kwangtung, so as to facilitate communications.

Two engineering corps have been sent out to make the necessary surveys.

LONG DISTANCE TELEPHONE.—Long-distance telephone service between Sian, capital of Shensi, and Chengchow, an important city in Honan, was inaugurated some time ago, according to information from local communications circles.

Three-minute calls from Sian to Shenchow, it is learned, will be \$1, to Chengchow \$2, and to Kaifeng, \$2.20. Service, it is further stated, may be connected with the other points within the Nine-Province phone network.

NEW Bucyrus-Erie 19-B

5/8 Yard Convertible Excavator

Modern in appearance; modern in design; modern in performance... this new Bucyrus-Erie 5/8-yard excavator weighs only 16 tons; is fully convertible, with all types of front-end equipment available; travels up to 1 3/4 M.P.H. under its own power; swings 4 3/4 R.P.M. on hooked, conical rollers; 37 anti-friction bearings; automatic lubrication; gasoline or Diesel power. Find out all about this new 5/8-yard machine today. Write:

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- efficient use of power for low-cost yardage
- compact, sturdy design for maximum stability
- strong, rugged construction that stands up to heavy digging
- all excess weight eliminated to make greatest possible use of power and speed
- convenient, quick convertibility
- dependable, economical operation